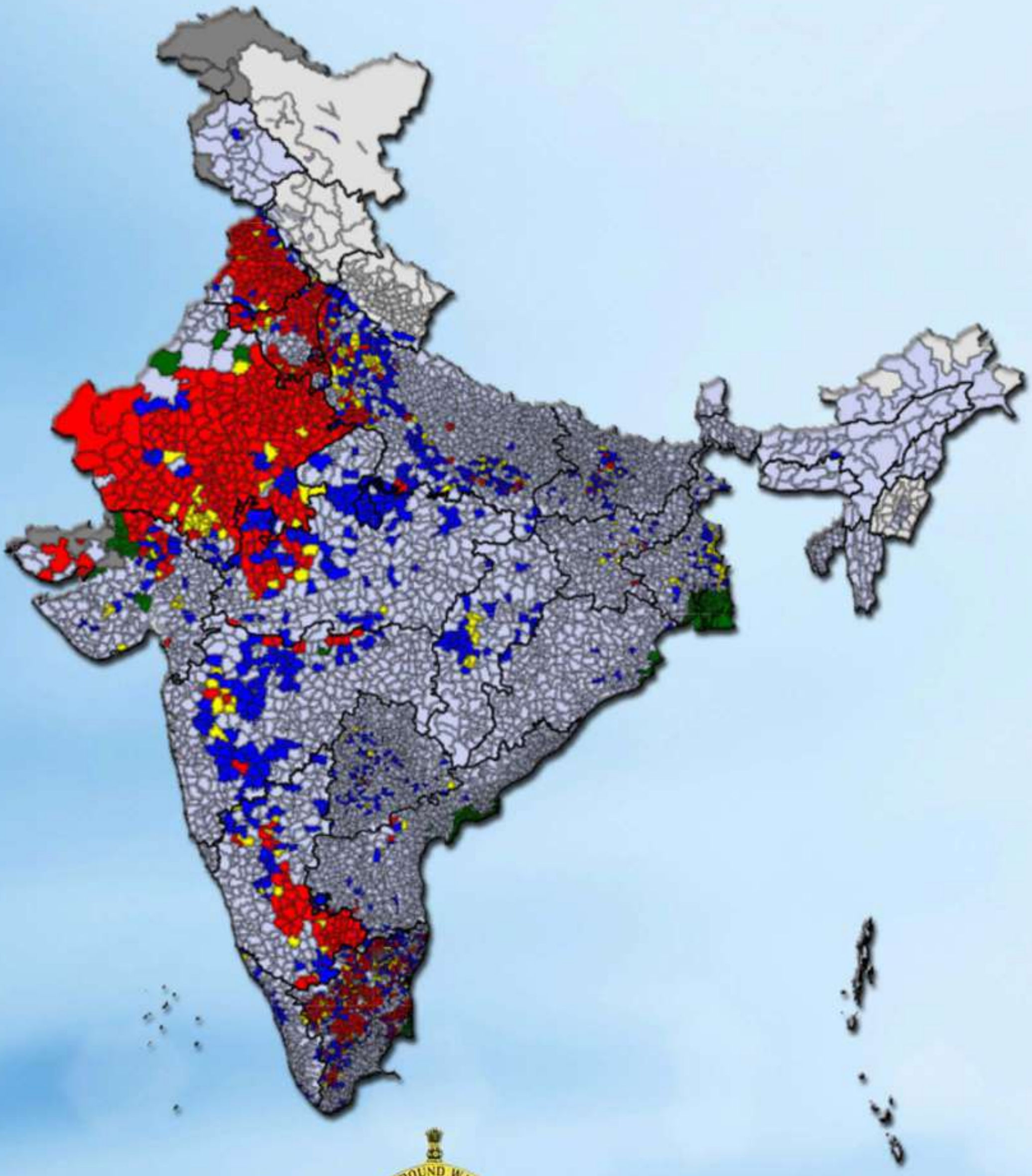
सत्यमेव जयते

National Compilation on
DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023



Central Ground Water Board

Department of Water Resources,
River Development and Ganga Rejuvenation
Ministry of Jal Shakti,
Government of India
Faridabad

National Compilation on

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023

Central Ground Water Board
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River Development & Ganga Rejuvenation
Ministry of Jal Shakti
Government of India

Faridabad
September, 2023

गजेन्द्र सिंह शेखावत
Gajendra Singh Shekhawat

सत्यमेव जयते

वसुधैव कुटुम्बकम्
ONE EARTH • ONE FAMILY • ONE FUTURE

आज़ादी का अमृत महोत्सव

जल शक्ति मंत्री
भारत सरकार
Minister for Jal Shakti
Government of India

0 6 OCT 2023

MESSAGE

Water, a precious and scarce natural resource, lies at the core of life, sustenance, food security, and sustainable development. Groundwater, in particular, has emerged as the key resourcefor India's agricultural and drinking water security. However, the declining water levels resulting from groundwater extraction exceeding its annual replenishment rate have become a concerning trend in various regions of the country over the last few decades. Addressing this situation necessitates effective management of our Nation's groundwater resources to ensure their long-term sustainability. It is imperative that sound decisions for sustainable groundwater management be rooted in a realistic assessment of resource availability. Periodic estimation of Dynamic Groundwater Resources is pivotal in providing vital information concerning annual replenishment, utilization, and the overall accessibility of groundwater to various stakeholders across all assessment units in the country.

The Dynamic groundwater resources of India undergo assessment every year through a collaborative effort involving State Governments and the Central Ground Water Board. This assessment serves as the cornerstone for categorizing assessment units across the country into various classifications, including Safe, Semi-Critical, Critical, or Over Exploited, based on their groundwater extraction levels. These categorizations are instrumental in shaping policies aimed at achieving sustainable groundwater management throughout the Nation.

I am optimistic that the 'National Compilation on Dynamic Ground Water Resources of India, 2023' through its provision of credible information regarding groundwater resource availability in the country, will serve as a guiding light for policymakers and other stakeholders. It will aid in the formulation of decisions and strategies aimed at ensuring the sustainable management of this crucial natural resource. Additionally, I firmly believe that this compilation will enlighten stakeholders about the current state of groundwater availability, prompting them to take measures for its optimal utilization and thereby ensure a water-secure future for the nation.

(GAJENDRA SINGH SHEKHAWAT)

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सत्यमेव जयते

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राज्य मंत्री
भारत सरकार, नई दिल्ली
Minister of State for Jal Shakti and Food Processing Industries
Government of India, New Delhi

Dated: 06-10-2023

MESSAGE

India, encompassing a vast geographical area of nearly 33 lakh square kilometers, is home to approximately 16% of the world's population but possesses only 4% of its freshwater resources. Furthermore, there exists significant inequality in the distribution of water resources within the country. Ground water serves as a primary source of drinking water as well as plays a crucial role in irrigation and industrial processes. However, around 70% of the country's groundwater resources are concentrated in the Indo-Ganga-Brahmaputra plains, which constitute only 30% of the total geographical area. Given this situation, effective management and sustainable development of the limited groundwater resources is of immense significance.

Management of groundwater resources calls for a systematic approach that involves scientific assessment of the availability of the groundwater resource and its utilization. Periodic monitoring of water levels and quality forms the key scientific input needed for assessment of the groundwater resource in the county. On the basis of the availability of the groundwater resource and the existing utilization pattern, comprehensive management strategies are chalked out to ensure its long-term sustainability. A crucial milestone in this endeavor is the realistic assessment of dynamic groundwater resources.

Central Ground Water Board (CGWB), in collaboration with State Groundwater Departments, conducts regular assessments of groundwater resources across the entire country. These assessments serve as the foundational basis for planning various groundwater management interventions, which may include initiatives such as managed aquifer recharge and the regulation of groundwater usage. The 'National Compilation on Dynamic Groundwater Resources of India, 2023' represents the consolidation of findings from the most recent assessment in this ongoing effort.

I extend my heartfelt congratulations to the Central Ground Water Board and the State/UT Ground Water Departments for their dedicated efforts in producing this comprehensive report on such a vital subject. I hope that this report will stand as an invaluable source of information to guide the stakeholders towards sustainable groundwater management throughout the country.

(Prahlad Singh Patel)

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BISHWESWAR TUDU
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सत्यमेव जयते

आज़ादी का अमृत महोत्सव

जल शक्ति एवं
जनजातीय कार्य राज्य मंत्री
भारत सरकार
नई दिल्ली-110001
MINISTER OF STATE FOR
JAL SHAKTI & TRIBAL AFFAIRS
GOVERNMENT OF INDIA
NEW DELHI - 110001

Message

Water, a scarce natural resource, serves as the fundamental of life, livelihoods, food security, and sustainable development. Groundwater has emerged as the cornerstone of India's agricultural and drinking water security. However, groundwater levels are declining alarmingly due to excessive extraction. This predicament underscores the urgent need for prudent management of the country's groundwater resources to ensure their sustainability.

It is of paramount importance that decisions regarding groundwater management are grounded in scientific resource assessments. Dynamic groundwater resources serve as a measure of replenishable groundwater resources, encompassing their availability and utilization. Annually, State Governments, in collaboration with the Central Ground Water Board, assess India's dynamic groundwater resources. These assessments provide the foundation for categorizing various administrative units in the country into Safe, Semi-Critical, Critical, or Over Exploited categories, guiding the management and regulation of groundwater resources accordingly.

I am optimistic that this report will facilitate the responsible management of groundwater resources in the country and enlighten the general public and stakeholders by presenting scientific data on groundwater resources. This, in turn, may inspire everyone to make optimal use of this vital resource, ensuring a balanced present and a sustainable future.

10/10/2023
(Bishweswar Tudu)

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देवश्री मुखर्जी
DEBASHREE MUKHERJEE
सचिव
SECRETARY

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES
RIVER DEVELOPMENT & GANGA REJUVENATION

Message

Groundwater, in the Indian context, has emerged as a key resource for sustenance of life and sustainability of livelihood. The increasing reliance on groundwater as a dependable source of water has led to its extensive and sometimes unplanned exploitation in various regions of the country, often overlooking the crucial aspects of aquifer recharge and other environmental factors. This unchecked development in certain parts of the country threatens the long-term sustainability of this precious resource. Scientific assessment of the availability of groundwater resources and its utilization status in different parts of the country provides the basic input for planning sustainable management interventions.

The Dynamic Groundwater Resource Assessment, conducted annually by the Central Ground Water Board in conjunction with State Ground Water Nodal Departments, highlights the extent of stress imposed on groundwater resources across different regions of the country. This comprehensive assessment entails meticulous analysis of voluminous data generated by the Ground Water Departments at both the State and Central levels. Based on in the findings of this groundwater assessment, administrative units are categorized into different levels of stress, ranging from 'safe', 'semi-critical', 'critical' and 'over-exploited'.

I extend my sincere appreciation to the Central Ground Water Board under the leadership of Chairman Shri Satish Kumar and the guidance provided by the team led by Shri Subodh Yadav, Joint Secretary (A, GW & IC), DoWR, RD & GR, for their commendable efforts in producing this publication on time. I am confident that this compilation will prove to be of immense value to administrators, planners, and all other stakeholders engaged in formulating strategies and interventions aimed at ensuring the long-term sustainability of groundwater.

(Debashree Mukherjee)

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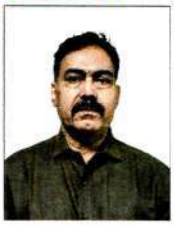
सतीश कुमार
अध्यक्ष
Satish Kumar
Chairman



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
केंद्रीय भूमि जल बोर्ड

Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development and Ganga Rejuvenation
Central Ground Water Board

Foreword

Groundwater, the most abundant source of freshwater, plays a pivotal role in economic growth of the Nation and serves as a fundamental element of our ecological system. India's agricultural productivity, industrial outputs and drinking and domestic water requirements are heavily dependent on groundwater. However, the increasing demands for water has spurred excessive extraction of groundwater in various regions across India, surpassing its annual replenishment rate. A pragmatic assessment of this invaluable resource serves as the cornerstone for devising strategies aimed at the judicious and scientific management of groundwater resources. Since 2022, it has been decided to carry out the estimation of the Dynamic Groundwater Resources of the nation every year to provide the planners, decision makers and all stakeholders with reliable data/information for taking timely measures for sustainable management of groundwater resources

The assessment of India's dynamic groundwater resources is based on the Groundwater Estimation Methodology of 2015 (GEC-2015), which comprehensively factors in all relevant parameters contributing to groundwater recharge and extraction. The Dynamic Groundwater Resource Assessment of 2023 (GWRA-2023) for all States and Union Territories is a collaborative effort involving both the respective State/UT Ground Water Departments and the Central Ground Water Board, utilizing the INDIA-Ground Water Resource Estimation System (IN-GRES) Software.

I extend my sincere appreciation to the dedicated officers of CGWB, CHQ, who played a pivotal role in the meticulous work of compiling the data at the national level. I also extend my appreciation to the officers of CGWB and the State Ground Water Nodal Departments for their tireless efforts in conducting assessments for their respective States and Union Territories as per the planned schedule.

The invaluable contributions of the members of the CLEG and SLCs in refining the National Report are gratefully acknowledged. I hope that this comprehensive national compilation will prove to be an invaluable resource for the planners, decision makers and all concerned stakeholders in prioritizing actions that are needed for ensuring sustainability of groundwater resources in the country.

29/09/2023
(Satish Kumar)
Chairman

Faridabad
September, 2023

सुबोध यादव
संयुक्त सचिव
Subodh Yadav
Joint Secretary

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

भारत सरकार
जलशक्ति मंत्रालय
जल संसाधन, नदी विकासऔर गंगा संरक्षण विभाग

Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development and Ganga Rejuvenation

Message

Groundwater has become a vital resource for the people of India over the years. In order to meet the ever-increasing water requirements while remaining committed to a sustainable future, it is imperative tomanage groundwater resources on sound scientific principles. Sustainable management of groundwater resources assumes specialsignificance in the Indian context as some parts of the country, especially in peninsular India and the arid regions of north-western Indiaare experiencing increasing stress on their groundwater reserves. While at the same time opportunity for optimal utilization of the resource exists in other parts of the country, particularly in the eastern and northeastern states.The availability of information on the status of groundwater resources in the country is essential to facilitate effective management decisions by policy planners. Towards this end, assessment of the dynamic ground water resources of the country is an important exercise that is carried out jointly by CGWB and the concerned States/UTs.

Considering the importance of the assessment of ground water resources, the Ministry of Jal Shakti has decided to bring out the assessment report on a yearly basis from the year 2022, and a dedicated web based application "INdia-Groundwater Resource Estimation System (IN-GRES)" was developed for faster and accurate assessment process. The assessment of Ground Water Resources across the country is a cooperative and collaborative effort between the State/Union Territory and the Central Ground Water Board. This exercise holds paramount importance as it provides essential insights for stakeholders, enabling them to take effective measures for the optimal utilization and management of groundwater resources.

The report, titled 'National Compilation on Dynamic Ground Water Resources of India, 2023,' serves as a comprehensive summary of the assessment results. It primarily focuses on aspects such as resource availability, utilization, and the categorization of assessment units. It is heartening to know that Annual ground water recharge and annual extractable ground water resources have further improved in year 2023 from the previous assessment in 2022. The 'stage of ground water extraction' has declined from 60.08% in 2022 to 59.26% in 2023, indicating overall improvement in ground water resources.

The efforts put in by the officers of the Central Ground Water Board and the State Government Departments in bringing out 'National Compilation on Dynamic Groundwater Resources of India-2023' deservespecial mention. I congratulate the entire team of officers from CGWB and the States/UTs for this report which will be of immense use toall the concerned stakeholders in chalking out the strategies for sustainable management of groundwater resources in the country.

(Subodh Yadav)
Joint Secretary

टी. एस. अनीता श्याम
सदस्य (दक्षिण)
T. S. Anitha Shyam
Member (South)

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
केंद्रीय भूमि जल बोर्ड
Government of India
Ministry of JalShakti
Department of Water Resources,
River Development and Ganga Rejuvenation
Central Ground Water Board

Preface

Groundwater is a crucial resource, meeting to the water needs of agriculture, households, and industries in our nation. Unfortunately, its development occurs haphazardly through individual entrepreneurs in an unscientific manner, leading to over-exploitation in certain regions. To guarantee the sustainability of this vital resource, prudent management is essential. Making sound groundwater management decisions requires accurate resource assessments. Dynamic assessments of groundwater resources offer insight into the extent of groundwater utilization, enabling more informed and effective management practices.

With this objective, dynamic groundwater resources of the Country is assessed annually using a well-established methodology known as the 'Ground Water Estimation Methodology' or GEC-15. The Dynamic Groundwater Resource Assessment of 2023 (GWRA-2023) for all States and Union Territories is a collaborative effort involving both the respective State/UT Ground Water Departments and the Central Ground Water Board, utilizing the INDIA-Ground Water Resource Estimation System (IN-GRES) Software.

The current assessment of India's groundwater resources reveals that the annual ground water recharge totals 449.08bcm, with an annual extractable ground water resource of 407.21 bcm. In 2023, the nation's annual groundwater extraction reaches 241.34 bcm, with an average stage of ground water extraction as 59.26%. Among 6,553 assessment units(Blocks/Mandals/Talukas), 736 units (11.23%) are 'Over-exploited,' extracting more than the annual recharge. 199 assessment units (3.04%) are 'Critical' with extraction levels between 90-100%, while 698 assessment units (10.65%) are 'Semi-critical' (70-90% stage of ground water extraction). The majority, 4,793 assessment units (73.14%), are 'Safe,' with stage of ground water extraction below 70%. Additionally, 127 assessment units (1.94%) are 'Saline' due to brackish or saline groundwater in phreatic aquifers.

I commend the dedicated officers of CGWB, CHQ for their pivotal role in compiling national-level data and the tireless efforts of CGWB' Regional, State Unit offices and State Ground Water Nodal Departments in conducting assessments. I appreciate the contributions of CLEG and SLC members in refining the National Report. This compilation will serve as a valuable resource for planners, decision-makers, and stakeholders in ensuring groundwater resource sustainability.

(T. S. Anitha Shyam)
Member (South) &
Member Secretary (CLEG)

National Compilation on Dynamic Ground Water Resources of India, 2023

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3.	Annual Ground Water Extraction	: 241.34 bcm
4.	Stage of Ground Water Extraction	: 59.26%

CATEGORIZATION OF ASSESSMENT UNITS

(Blocks/ Mandals/ Taluks etc.)

Sl.No	Category	Number of Assessment Units		Recharge worthy Area		Annual Extractable Ground Water Resource	
		Number	**%**	**in lakh sq. km**	%	**(in bcm)**	%
1	Safe	4793	73	16.3	66.15	301.80	74.11
2	Semi Critical	698	11	2.92	11.85	47.37	11.63
3	Critical	199	3	0.86	3.49	12.91	3.17
4	Over-Exploited	736	11	4.18	16.95	45.12	11.08
5	Saline	127	2	0.38	1.55	NA	NA
	TOTAL	**6553**		**24.67**		**407.21**	

EXECUTIVE SUMMARY

Ground Water Resource Assessment is carried out at periodical intervals jointly by State Ground Water Departments and Central Ground Water Board under the guidance of the respective State Level Committee on Ground Water Assessment at State Levels and under the overall supervision of the Central Level Expert Group (CLEG). Such joint exercises have been taken up earlier in 1980, 1995, 2004, 2009, 2011, 2013, 2017, 2020 and 2022. From 2022, the exercise is being carried out annually.

The assessment involves computation of dynamic ground water resources or Annual Extractable Ground Water Resource, Total Current Annual Ground Water Extraction (utilization) and the percentage of utilization with respect to annual extractable resources (stage of Ground Water Extraction). The assessment units (Talukas/blocks/mandals) are categorized based on Stage of Ground Water Extraction, which are then validated with long-term water level trends. The assessment prior to that of year 2017 were carried out following Ground Water Estimation Committee (GEC) 97 Methodology, whereas from2017 onwards assessment are based on norms and guidelines of the GEC 2015 Methodology.

The main source of replenishable ground water resources is recharge from rainfall, which contributes to nearly 60 % of the total annual ground water recharge. India receives about 119cm. of rain annually on an average, with high spatial variation. A major part of the country receives rainfall mainly during SW Monsoon season, spread over the months of June to September, except in Tamil Nadu, where the major contribution is from NE monsoon during the period October– December. There are also States such as Jammu and Kashmir, Himachal Pradesh and Uttarakhand which receive significant rainfall in all seasons.

Over 75% of the annual rainfall is received in the four rainy months from June to September only thereby leading to large variations on temporal scale. The average annual rainfall is 119 cm, but it has great spatial variations. The areas on Western Ghats, Sub-Himalyan areas in North East and Meghalaya Hills receive heavy rainfall over 250 cm annually, whereas the areas of Northern parts of Kashmir and Western Rajasthan receive rainfall less than 40 cm. A major part of the country including Northern, Central and Eastern parts receives annual normal rainfall between 75 and 150 cm. In general, rainfall decreases westwards in the northern part of the country, whereas it decreases eastwards and then increases toward the coast in Peninsular India.

Type of rock formations and their storage and transmissive characteristics have a significant influence on ground water recharge. Porous formations such as the alluvial formations in the Indo-Ganga-Brahmaputra basin generally have high specific yields and are good repositories of ground water. Ground water occurrence in the fissured formations occupying nearly two-thirds of the geographical area of the country, on the other hand, is mostly limited to the weathered, jointed and fractured portions of the rocks.

In the present assessment, the total annual groundwater recharge in the country has been assessed as 449.08 bcm. Keeping an allocation for natural discharge, the annual extractable ground water resource has been assessed as 407.21 bcm. The annual groundwater extraction (as in 2023) is 241.34 bcm. The average stage of groundwater extraction for the country as a whole works out to be about 59.26 %. Out of the total 6553 assessment units (Blocks/ Mandals/ Talukas) in the country, 736 units in various States/ UTs (11.23%) have been categorized as 'Over-exploited' indicating ground water extraction exceeding the annually replenishable ground water recharge. In, 199 (3.04 %) assessment units the stage of groundwater extraction is between 90-100% and have been categorized as 'Critical'. There are 698 (10.65 %) "Semi-critical'' units, where the stage of ground water extraction is between 70 % and 90 % and 4793 (73.14 %) 'Safe 'units, where the stage of Ground water extraction is less than 70 %. Apart from these, there are 127 (1.94%) assessment units, which have been categorised as 'Saline' as major part of the ground water in phreatic aquifers in these units is brackish or saline.

Similarly out of 24.67 lakh sq km recharge worthy area of the country, 4.18 lakh sq km (17 %) are under 'Over-Exploited', 0.86 lakh sq km (3 %) are under 'Critical', 2.92 lakh sq km (12 %) are under 'Semi-Critical', 16.3 lakh sq km (66 %) are under 'Safe' and 0.38 lakh sq km (2 %) are under 'Saline' category assessment units. Out of 407.21 bcm of Total Annual Extractable Resources of the country, 45.12 bcm (11 %) are under 'Over-Exploited', 12.92 bcm (3 %) are under 'Critical', 47.38 bcm (12 %) are under 'Semi-Critical', 301.8 bcm (74 %) are under 'Safe' category assessment units.

In comparison to 2022 assessment, the total numbers of assessment units in the country have decreased from 7089 to 6553 with major contribution (in decrease) from the State of Tamil Nadu, Andaman & Nicobar Islands and Lakshadweep. Previously, resource estimations were made at the Firqa and island levels, but in this assessment, they have been estimated at the Taluk and Block levels respectively. Conversely, in Assam and Arunachal Pradesh, the assessment units have been changed from district level to block level in the present estimation. The total annual ground water recharge has increased from 437.6 bcm to 449.53 bcm, where major increase is noticed in the States of West Bengal, Assam, Telangana, Chhatisgarh, Karnataka, Gujarat and Bihar. The changes are attributed mainly to changes in recharge from 'Other Sources'. Accordingly, the annual extractable resource as per Ground Water Resource Assessment, 2023 in comparison to the Ground Water Resource Assessment, 2022 also shows an increase from 398.08 bcm to 407.21 bcm. The ground water extraction has marginally increased from 239.16bcm to 241.34 bcm. The overall stage of groundwater extraction has marginally decreased from 60.08 % to 59.26 %.

The over-exploited assessment units are mostly concentrated in :(i) the north western part of the country including parts of Punjab, Haryana, Delhi and Western Uttar Pradesh where even though the replenishable resources are abundant, there has been indiscriminate withdrawals of ground water leading to over-exploitation; (ii) the western part of the country, particularly in parts of Rajasthan and Gujarat, where due to arid climate, groundwater recharge itself is limited, leading to stress on the resource and (iii) the southern part of peninsular India including parts of Karnataka, Tamil Nadu Telangana and Andhra Pradesh, where due to inherent characteristics of crystalline aquifers, the ground water availability is low. In some areas of the country, good continuous rainfall and management practices like ground water augmentation and conservation measures through government and private initiatives have resulted in improvement in ground water situation. Ground water resources assessment, like other fields of science, requires continuous refinements.

CHAPTER 1

1.0 INTRODUCTION

Water is a fundamental resource for life. Ground water has become an increasingly important natural resource catering to the fresh water requirements of various sectors in India. Sustainable development and efficient management of this scarce resource has become a challenge. Ground water has steadily emerged as the backbone of India’s agriculture and drinking water security. Contribution of ground water is nearly 62% in irrigation, 85% in rural water supply and 50% in urban water supply. Ground water is an annually replenishable resource but its availability is non- uniform in space and time. Ground water available in the zone of water level fluctuation is replenished annually with rainfall being the dominant contributor. Hence, the sustainable utilization of ground water resources demands a realistic quantitative assessment of ground water availability in this zone based on reasonably valid scientific principles. National Water Policy, 2012 has laid emphasis on periodic assessment of ground water resources on scientific basis. The trends in water availability due to various factors including climate change must also be assessed and accounted for during water resources planning. To meet the increasing demands of water, it advocates direct use of rainfall, desalination and avoidance of inadvertent evapotranspiration for augmenting utilizable water resources. The National Water Policy 2012 also states that safe water for drinking and sanitation should be considered as pre-emptive needs followed by high priority allocation for other domestic needs (including needs of animals), achieving food security, supporting sustenance agriculture and minimum eco- system needs. Available water, after meeting the above needs should be allocated in a manner to promote its conservation and efficient use.

1.1 PREVIOUS ASSESSMENTS

Assessment of water resources of the country dates back to 1901 when the First Irrigation Commission assessed the Surface Water Resources as 144 million hectare meters (M.ham) (NABARD, 2006). In 1949, Dr. A. N. Khosla, based on empirical formulae, estimated the total average annual runoff of all the river systems of India including both surface and ground water resources as 167 M.ham (CGWB, 1995). Since then attempts have been made from time to time by various Working Groups/ Committees/Task Forces constituted by Govt. of India to estimate the ground water resources of the country based on available data and in response to developmental needs. In 1976, National Commission of Agriculture assessed the total ground water resources of the country as 67 M.ham and the utilizable ground water as 35 M.ham, out of which 26 M.ham was considered available for irrigation (CGWB, 1995).

The first systematic methodology to assess the ground water resources of the country was evolved by Ground Water Over-Exploitation Committee in 1979. The committee was constituted by Agriculture Refinance and Development Corporation (ARDC) and was headed by Chairman, CGWB with Members from State Ground Water Organizations and Financial Institutions. Based on the norms suggested by the committee, the country's Gross Ground Water Recharge was assessed as 47 M.ham and the Net Recharge as 32 M.ham (CGWB, 1995).

In 1982, Government of India constituted 'Ground Water Estimation Committee' (GEC) drawing Members from various States / Central organizations engaged in hydrogeological studies and groundwater development. The Committee submitted its recommendations in the year 1984 and suggested a methodology for assessment of dynamic groundwater resources, which is commonly referred to as GEC 1984. As per the recommendations of the GEC 1984, State Governments constituted Working Groups for assessment of ground water potential. The Working Groups were headed by Secretaries in-charge of Ground Water Developments and included Heads of Ground Water Departments, State Agriculture Departments, representatives from Agriculture Universities and NABARD as members. Director, CGWB was the convener of the group. The base year for the computation of the resource varied between 1991 and 1993 and a National report on Ground Water Resources of India was brought out in 1995 by compiling the data of all the States and Union Territories. As per the report, the Total Replenishable Ground Water in India was assessed as 432 billion cubic meter (bcm). The ground water resource available for irrigation purpose was about 361 bcm.The Net Ground Water Draft for Irrigation uses was about 115 bcm, there by arriving at the level of ground water development as 32 %. Utilizable Irrigation Potential from ground water of the country was worked out to be 64 million hectare meter (CGWB, 1995).

Increasing thrust on ground water and improved techniques for data acquisition led the Government of India to form another Committee in 1995 to review the existing methodology for ground water resource assessment and to suggest revisions, if necessary. The Committee submitted its report in 1997 wherein a revised and elaborate methodology for resource assessment was suggested, which was referred as GEC 1997. In view of the limitations of ground water assessment in hard rock terrain, another Committee on Ground Water Estimation Methodology in Hard Rock Terrain was formed in 2001 to review the existing methodology for resource estimation in such formations. The Committee made certain suggestions on the criteria for categorization of blocks to be adopted for the entire country irrespective of the terrain conditions. Based on GEC 1997, the dynamic ground water resources of India have been estimated for the entire country considering 2004, 2009, 2011 and 2013 as base years. The methodology underwent comprehensive revisions again in 2015 and a revised methodology, namely GEC 2015 methodology has been prescribed for ground water assessment. This methodology is being followed for assessment carried out from 2017 onwards.

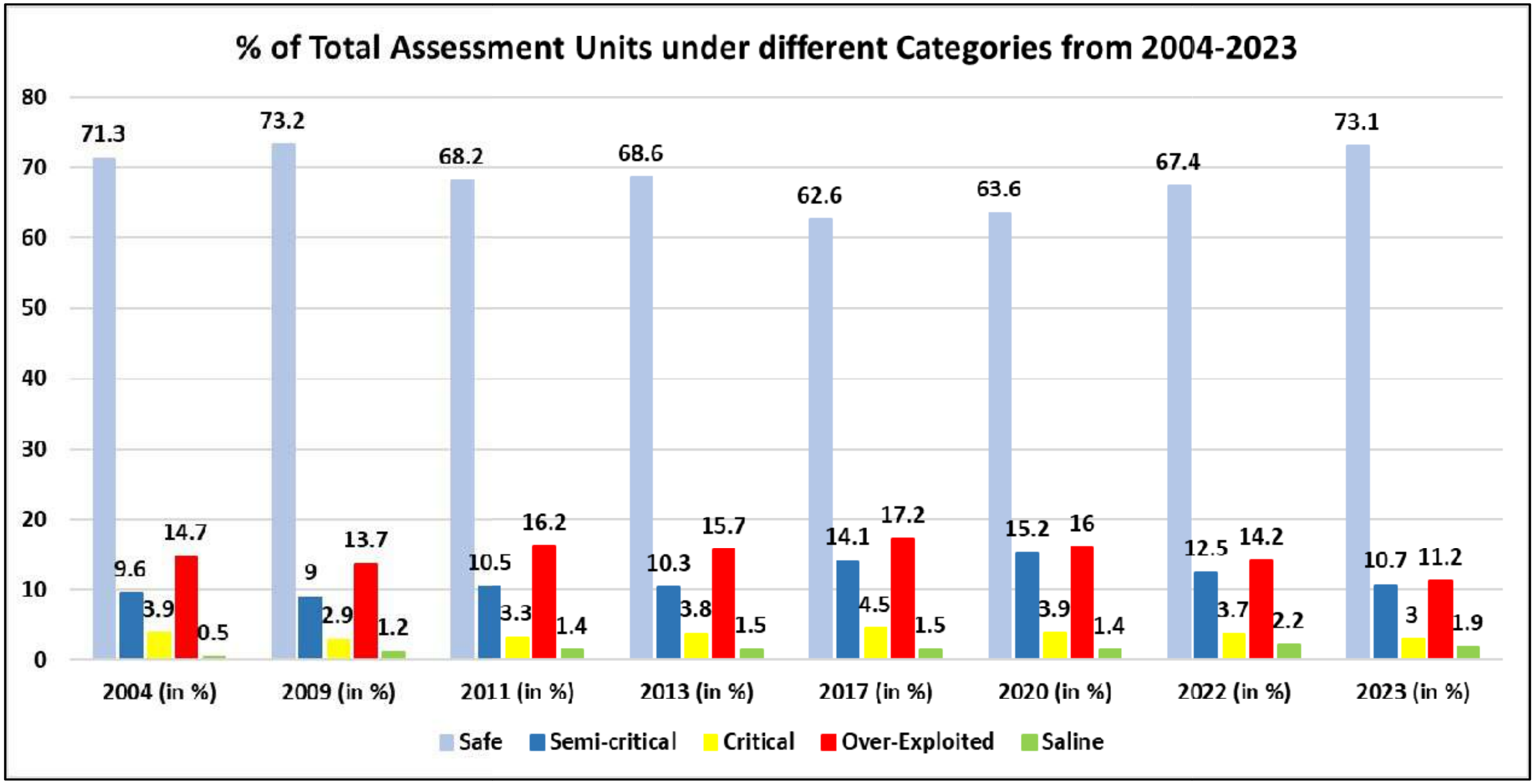
In the present assessment, the total annual groundwater recharge in the country has been assessed as 449.08 bcm. Keeping an allocation for natural discharge, the annual extractable ground water resource has been assessed as 407.21 bcm. The annual groundwater extraction (as in 2023) is 241.34 bcm. The average stage of groundwater extraction for the country as a whole works out to be about 59.26 %. Out of the total 6553 assessment units (Blocks/ Mandals/ Talukas) in the country, 736 units in various States/ UTs (11.23%) have been categorized as 'Over-exploited' indicating ground water extraction exceeding the annually replenishable ground water recharge. In, 199 (3.04 %) assessment units the stage of groundwater extraction is between 90-100% and have been categorized as 'Critical'. There are 698 (10.65 %) "Semi-critical'' units, where the stage of ground water extraction is between 70 % and 90 % and 4793 (73.14 %) 'Safe'units, where the stage of Ground water extraction is less than 70 %. Apart from these, there are 127 (1.94%) assessment units, which have been categorised as 'Saline' as major part of the ground water in phreatic aquifers in these units is brackish or saline. Salient details of status of ground water resources and categorization of assessment units in 2004, 2009, 2011, 2013, 2017, 2020.2022 and 2023are shown in ***Table-1.1*** and ***Table-1.2***respectively.

Table-1.1: Ground water Resources assessment 2004 to 2023

S. No.	Ground Water Resources Assessment	2004	2009	2011	2013	2017	2020	2022	2023
1	Annual Ground Water Recharge (bcm)	433	431	433	447	432	436	438	449
2	Annual Extractable Ground Water Resource (bcm)	399	396	398	411	393	398	398	407
3	Annual Ground Water Extractionfor Irrigation, Domestic & Industrial uses(bcm)	231	243	245	253	249	245	239	241
4	Stage of Ground Water Extraction (%)	58 %	61 %	62 %	62 %	63 %	62 %	60%	59%

Table-1.2: Categorization of assessment units from 2004 to 2023

		2004		2009		2011		2013		2017		2020		2022		2023	
S. No.	**Categorization of Assessment Units**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
1	Total Assessed units	**5723**		**5842**		**6607**		**6584**		**6881**		**6965**		**7089**		**6553**	
2	Safe	4078	71.3	4277	73.2	4503	68.2	4519	68.6	4310	62.6	4427	63.6	4780	67.4	4793	73.1
3	Semi-critical	550	9.6	523	9	697	10.5	681	10.3	972	14.1	1057	15.2	885	12.5	698	10.7
4	Critical	226	3.9	169	2.9	217	3.3	253	3.8	313	4.5	270	3.9	260	3.7	199	3
5	Over-Exploited	839	14.7	802	13.7	1071	16.2	1034	15.7	1186	17.2	1114	16	1006	14.2	736	11.2
6	Saline	30	0.5	71	1.2	92	1.4	96	1.5	100	1.5	97	1.4	158	2.2	127	1.9


% of Total Assessment Units under different Categories from 2004-2023
80
70
60
50
40
30
20
10
0
71.3
9.6
3.9
14.7
0.5
73.2
9
2.9
13.7
1.2
68.2
10.5
3.3
16.2
1.4
68.6
10.3
3.8
15.7
1.5
62.6
14.1
4.5
17.2
1.5
63.6
15.2
3.9
16
1.4
67.4
12.5
3.7
14.2
2.2
73.1
10.7
3
11.2
1.9
2004 (in %)
2009 (in %)
2011 (in %)
2013 (in %)
2017 (in %)
2020 (in %)
2022 (in %)
2023 (in %)
Safe
Semi-critical
Critical
Over-Exploited
Saline

1.2 GROUND WATER ASSESSMENT AND MANAGEMENT INITIATIVES

The inferences drawn from the ground water resources assessment is utilized as an input by the planners and stakeholders for taking appropriate management measures for optimal utilization and sustainable development of the ground water resources. Several measures, primarily based on the findings of the resource assessment, have been taken up by the Government of India to replenish/augment ground water resources.

Initiatives by the Government of India in this regard includes constitution of Central Ground Water Authority for regulation of ground water development in the country and compilation of a conceptual document titled "Master Plan for Artificial Recharge to Ground water in India" by CGWB, which envisages implementation of nearly 11 million Rain Water Harvesting and Artificial Recharge structures to augment the ground water resources of the country. Ministry of Jal Shakti has also circulated a Model Bill to all States/UTs to enable them to enact suitable legislation for regulation of ground water development, which includes provision of rainwater harvesting. CGWB has taken up National Aquifer Mapping & Management Programme (NAQUIM), for mapping of major aquifers, their characterization and formulation of Aquifer Management Plans to ensure sustainability of the resources, prioritising Over-exploited, Critical and Semi-critical assessment units. Several State Governments are implementing watershed development programmes, in which, ground water conservation forms an integral part.Water conservation measures are also taken up as a part of the MGNREGA. Ministry of Jal Shakti has launched 'Jal Kranti Abhiyan', aimed at consolidating water conservation and management initiatives in the country through a holistic and integrated approach involving all stakeholders. Atal Bhujal Yojana, being implemented from April 2020, envisages improving ground water management in identified water-stressed areas in parts of seven States in the country with emphasis on demand management and community participation. In addition, schemes of the Government of India such as Pradhan Mantri Krishi Sinchai Yojana (PMKSY)-Har Khet Ko Pani (HKKP)- Ground Water Irrigation(GWI) envisages creation of irrigation potential from groundwater in assessment units where there is sufficient scope for further future ground water development. With a view to further promote water conservation in the country, Ministry of Jal Shakti, Government of India has embarked on the Jal Shakti Abhiyan in 2019. This initiative is characterized by the expeditious execution of five discerning interventions: water conservation and the harnessing of rainwater, revitalization of traditional and contemporary aquatic ecosystems, the recycling and replenishment of water, watershed development, and the deliberate augmentation of afforestation efforts. This ambitious undertaking was initially launched across 1,592 blocks, in 256 water-stressed districts across the nation. Subsequently, this pivotal campaign has been extended and reinforced during the years 2022 and 2023, accentuating the government's unwavering commitment to addressing the critical issues surrounding water conservation and resource management.

1.3 RE-ASSESSMENT OF GROUND WATER RESOURCES, 2023

Ministry of Jal Shakti, Department of Water Resources, River Development & Ganga Rejuvenation, constituted a permanent Central Level Expert Group (CLEG) for over-all supervision of the re-assessment of ground water resources in the entire country as in 2023. The terms of reference of the committee include supervision of assessment of annual replenishable ground water resources and the status of utilization for reference year 2023 onwards. A copy of the Government Resolution is in **Appendix A**.

Groundwater resources assessment for reference year 2023 at the State/U.T Levels have been carried out jointly by State Ground Water Departments and Central Ground Water Board under the supervision of State Level Committees (**Appendix B**), with technical guidance from Central Level Expert Group. The assessment carried out was approved by the respective State Level Committee (**Appendix D**). For four States/UTs (Chhattisgarh, Haryana, Dadra & Nagar Haveli, Daman& Diu, Jammu & Kashmir.) the assessments are yet to be approved in State Level Committee. Based on the assessments provided by the respective State Level Committees and joint assessment made in the aforesaid States, the National Level Report titled “Dynamic Ground Water Resources of India-2023” has been compiled.The National compilation report provides summary and analysis of ground water resources in different States. The report was reviewed and deliberated upon during the meeting of CLEG held on 27.09.2023 and was approved as mentioned in **Appendix E.**

CHAPTER 2

2.0 GROUND WATER RESOURCES ESTIMATION METHODOLOGY

Ground water resource as in 2023 have been estimated following the guidelines mentioned in the GEC 2015 methodology using appropriate assumptions depending on data availability. The principal attributes of GEC 2015 methodology is given below:

The methodology recommends aquifer wise ground water resource assessment of both the Groundwater resources components, i.e., Replenishable ground water resources or Dynamic Ground Water Resources and In-storage Resources or Static Resources. Wherever the aquifer geometry has not been firmly established for the unconfined aquifer, the in-storage ground water resources have to be assessed in the alluvial areas down to the depth of bed rock or 300 m, whichever is less. In case of hard rock aquifers, the depth of assessment would be limited to 100 m. In case of confined aquifers, if it is known that groundwater extraction is being done from this aquifer, the dynamic as well as in-storage resources are to be estimated. If it is firmly established that there is no ground water extraction from this confined aquifer, then only in-storage resources of that aquifer has to be estimated. Until aquifer geometry is established on appropriate scale, the existing practice of using watershed in hard rock areas and blocks/mandals in soft rock areas may be continued.

It is also pertinent to add that as it is advisable to restrict the groundwater development as far as possible to annual replenishable resources, the categorization also takes into account the relation between the annual replenishment and groundwater development. An area devoid of ground water potential may not be considered for development and may remain safe whereas an area with good groundwater potential may be developed and may become over exploited over a period of time. Thus, water augmentation efforts can be successful in such areas, where the groundwater potential is high and there is scope for augmentation.

2.1. GROUND WATER ASSESSMENT OF UNCONFINED AQUIFER

Though the assessment of ground water resources includes assessment of dynamic and in-storage resources, the development planning should mainly focus on dynamic resource as it gets replenished on an annual basis. Changes in static or in-storage resources normally reflect long-term impacts of ground water mining. Such resources may not be replenishable annually and may be allowed to be extracted only during exigencies with proper planning for augmentation in the succeeding excess rainfall years.

2.1.1. Assessment of Annually Replenishable or Dynamic Ground Water Resources

The methodology for ground water resources estimation is based on the principle of water balance as given below –

$$\boldsymbol{Inflow - Outflow = ChangeinStorage(ofanaquifer)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(\mathbf{1})$$

Equation (1) can be further elaborated as –

$$\Delta \boldsymbol{S = R_{RF} + R_{STR} + R_C + R_{SWI} + R_{GWI} + R_{TP} + R_{WCS} \pm VF \pm LF - GE - T - E - B} \ldots\ldots..(\mathbf{2})$$

Where,

ΔS - Change is storage
R_{RF} - Rainfall recharge
R_{STR} - Recharge from stream channels
R_C - Recharge from canals
R_{SWI} - Recharge from surface water irrigation
R_{GWI} - Recharge from ground water irrigation
R_{TP} - Recharge from Tanks & Ponds
R_{WCS} - Recharge from water conservation structures
VF - Vertical flow across the aquifer system
LF - Lateral flow along the aquifer system (through flow)
GE - Ground Water Extraction
T - Transpiration
E - Evaporation
B - Base flow

It is preferred that all the components of water balance equation should be estimated in an assessment unit. Due to lack of data for all the components in most of the assessment units, it is proposed that at present the water budget may be restricted to the major components only, taking into consideration certain reasonable assumptions. The estimation is to be carried out using lumped parameter estimation approach keeping in mind that data from many more sources if available may be used for refining the assessment.

2.1.1.1. Rainfall Recharge

It is recommended that ground water recharge should be estimated on ground water level fluctuation and specific yield approach since this method takes into account the response of ground water levels to ground water input and output components. This, however, requires adequately spaced representative water level measurement for a sufficiently long period. It is proposed that there should be at least three spatially well distributed observation wells in the assessment unit, or one observation well per 100 sq. Km. Water level data should also be available for a minimum period of 5 years (preferably 10years), along with corresponding rainfall data. Regarding frequency of water level data, two water level readings, during pre and post monsoon seasons, are the minimum requirement. It would be ideal to have monthly water level measurements to record the peak rise and maximum fall in the ground water levels. In units or subareas where adequate data on ground water level fluctuations are not available as specified above, ground water recharge may be estimated using rainfall infiltration factor method only. The rainfall recharge during non-monsoon season may be estimated using rainfall infiltration factor method only.

2.1.1.1.1. Ground Water Level Fluctuation Method

The ground water level fluctuation method is to be used for assessment of rainfall recharge in the monsoon season. The ground water balance equation in non-command areas is given by

$$\Delta S = R_{RF} + R_{STR} + R_{SWI} + R_{GWI} + R_{TP} + R_{WCS} \pm VF \pm LF - GE - T - E - B \ldots\ldots\ldots\ldots\ldots\ldots..(3)$$

Where,

ΔS - Change is storage
R_{RF} - Rainfall recharge
R_{STR} - Recharge from stream channels
R_{SWI} - Recharge from surface water irrigation
R_{GWI} - Recharge from ground water irrigation
R_{TP} - Recharge from Tanks& Ponds
R_{WCS} - Recharge from water conservation structures
VF - Vertical flow across the aquifer system
LF - Lateral flow along the aquifer system (through flow)
GE - Ground water extraction
T - Transpiration
E - Evaporation
B - Base flow

Whereas the water balance equation in command area will have another term i.e., Recharge due to canals (R_C) and the equation will be as follows:

$$\Delta \boldsymbol{S} = \boldsymbol{R_{RF}} + \boldsymbol{R_{STR}} + \boldsymbol{R_C} + \boldsymbol{R_{SWI}} + \boldsymbol{R_{GWI}} + \boldsymbol{R_{TP}} + \boldsymbol{R_{WCS}} \pm \boldsymbol{VF} \pm \boldsymbol{LF} - \boldsymbol{GE} - \boldsymbol{T} - \boldsymbol{E} - \boldsymbol{B} \ldots\ldots\ldots\ldots\ldots (\mathbf{4})$$

A couple of important observations in the context of water level measurement must be followed. It is important to bear in mind that while estimating the quantum of ground water extraction, the depth from which ground water is being extracted should be considered. One should consider only the draft from the same aquifer for which the resource is being estimated.

The change in storage can be estimated using the following equation:

$$\Delta \boldsymbol{S} = \Delta \boldsymbol{h} \times \boldsymbol{A} \times \boldsymbol{S_Y} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{5})$$

Where,

ΔS - Change is storage
Δh - rise in water level in the monsoon season
A - Area for computation of recharge
S_Y - Specific Yield

Substituting the expression in equation (5) for storage increase ΔS in terms of water level fluctuation and specific yield, the equations (3) & (4) becomes (6) & (7) for non-command and command sub-units,

$$\boldsymbol{R_{RF}} = \Delta \boldsymbol{h} \times \boldsymbol{A} \times \boldsymbol{S_Y} - \boldsymbol{R_{STR}} - \boldsymbol{R_{SWI}} - \boldsymbol{R_{GWI}} - \boldsymbol{R_{TP}} - \boldsymbol{R_{WCS}} \pm \boldsymbol{VF} \pm \boldsymbol{LF} + \boldsymbol{GE} + \boldsymbol{T} + \boldsymbol{E} + \boldsymbol{B} \ldots\ldots\ldots\ldots\ldots (\mathbf{6})$$

$$\boldsymbol{R_{RF}} = \Delta \boldsymbol{h} \times \boldsymbol{A} \times \boldsymbol{S_Y} - \boldsymbol{R_{STR}} - \boldsymbol{R_C} - \boldsymbol{R_{SWI}} - \boldsymbol{R_{GWI}} - \boldsymbol{R_{TP}} - \boldsymbol{R_{WCS}} \pm \boldsymbol{VF} \pm \boldsymbol{LF} + \boldsymbol{GE} + \boldsymbol{T} + \boldsymbol{E} + \boldsymbol{B} \ldots\ldots\ldots (\mathbf{7})$$

Where base flow/ recharge to/from streams have not been estimated, the same is assumed to be zero. The rainfall recharge obtained by using equation (6) and (7) provides the recharge in any particular monsoon season for the associated monsoon season rainfall. This estimate is to be normalized for the normal monsoon season rainfall as per the procedure indicated below.

Normalization of Rainfall Recharge

Let R_i be the rainfall recharge and r_i be the associated rainfall. The subscript "i" takes values 1 to N where N is the number of years for which data is available. This should be at least 5. The rainfall recharge, R_i is obtained as per equation (6) & equation (7) depending on the sub-unit for which the normalization is being done.

After the pairs of data on R_i and r_i have been obtained as described above, a normalisation procedure is to be carried out for obtaining the rainfall recharge corresponding to the normal monsoon season rainfall. Let r(normal) be the normal monsoon season rainfall obtained as the average of recent 30 to 50 years of monsoon season rainfall. Two methods are possible for the normalisation procedure. The first method is based on a linear relationship between recharge and rainfall of the form

$$\boldsymbol{R = ar} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots\ldots\ldots.(\mathbf{8})$$

Where,

R = Rainfall recharge during monsoon season
r = Monsoon season rainfall
a = a constant

The computational procedure to be followed in the first method is as given below:

$$\boldsymbol{R_{RF}(normal)} = \frac{\sum_{i=1}^{N}\left[\boldsymbol{R_i}\frac{\boldsymbol{r(normal)}}{\boldsymbol{r_i}}\right]}{\boldsymbol{N}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots\ldots\ldots\ldots\ldots..(\mathbf{9})$$

Where,

R_{RF}(normal) - Normalized Rainfall Recharge in the monsoon season
R_i- Rainfall Recharge in the monsoon season for the i^{th}year
r(normal) - Normal monsoon season rainfall
r_i- Rainfall in the monsoon season for the i^{th} year
N - No. of years for which data is available

The second method is also based on a linear relation between recharge and rainfall. However, this linear relationship is of the form,

$$\boldsymbol{R_{RF}(normal) = a \times r(normal) + b} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(\mathbf{10})$$

Where,

R_{RF}(normal) - Normalized Rainfall Recharge in the monsoon season
r(normal) - Normal monsoon season rainfall
a and b - Constants.

The two constants 'a' and 'b' in the above equation are obtained through a linear regression analysis. The computational procedure to be followed in the second method is as given below:

$$\boldsymbol{a} = \frac{\boldsymbol{NS_4 - S_1S_2}}{\boldsymbol{NS_3 - S_1^2}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(\mathbf{11})$$

$$\boldsymbol{b} = \frac{\boldsymbol{S_2 - aS_1}}{\boldsymbol{N}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(12)}$$

Where,

$$\boldsymbol{S_1} = \sum_{i=1}^{N} \boldsymbol{r_i} \;\;,\;\; \boldsymbol{S_2} = \sum_{i=1}^{N} \boldsymbol{R_i} \;\;,\;\; \boldsymbol{S_3} = \sum_{i=1}^{N} \boldsymbol{r_i^2} \;\;,\;\; \boldsymbol{S_4} = \sum_{i=1}^{N} \boldsymbol{R_i r_i}$$

2.1.1.1.2. Rainfall Infiltration Factor Method

The rainfall recharge estimation based on Water level fluctuation method reflects actual field conditions since it takes into account the response of ground water level. However the ground water extraction estimation included in the computation of rainfall recharge using water level fluctuation approach is often subject to uncertainties. Therefore, it is recommended to compare the rainfall recharge obtained from water level fluctuation approach with that estimated using rainfall infiltration factor method. Recharge from rainfall is estimated by using the following relationship –

$$\boldsymbol{R_{RF}} = \boldsymbol{RFIF} \times \boldsymbol{A} \times \frac{(\boldsymbol{R - a})}{\mathbf{1000}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(13)}$$

Where,

R_{RF} - Rainfall recharge in ham

A - Area in hectares

RFIF - Rainfall Infiltration Factor

R- Rainfall in mm

a - Minimum threshold value above which rainfall induces ground water recharge in mm

The threshold limit of minimum and maximum rainfall event which can induce recharge to the aquifer is to be considered while estimating ground water recharge using rainfall infiltration factor method. The minimum threshold limit is in accordance with the relation shown in equation (13) and the maximum threshold limit is based on the premise that after a certain limit, the rate of storm rain is too high to contribute to infiltration and they will only contribute to surface runoff. It is suggested that 10% of Normal annual rainfall may be taken as minimum rainfall threshold and 3000 mm as maximum rainfall limit. While computing the rainfall recharge, 10% of the normal annual rainfall is to be deducted from the monsoon rainfall and balance rainfall would be considered for computation of rainfall recharge. The same recharge factor may be used for both monsoon and non-monsoon rainfall, with the condition that the recharge due to non-monsoon rainfall may be taken as zero, if the normal rainfall during the non-monsoon season is less than 10% of normal annual rainfall. In using the method based on the specified norms, recharge due to both monsoon and non-monsoon rainfall may be estimated for normal rainfall, based on recent 30 to 50 years of data.

2.1.1.1.3. Percent Deviation

After computing the rainfall recharge for normal monsoon season rainfall using the ground water level fluctuation method and rainfall infiltration factor method these two estimates have to be compared with each other. A term, Percent Deviation (PD) which is the difference between the two expressed as a percentage of the later is computed as

$$\boldsymbol{PD} = \frac{\boldsymbol{R_{RF}(normal, wtfm) - R_{RF}(normal, rifm)}}{\boldsymbol{R_{RF}(normal, rifm)}} \times \mathbf{100} \ldots\ldots\ldots\ldots\ldots.\ldots\ldots\ldots.(\mathbf{14})$$

Where,

R_{RF} (normal, wlfm) =	Rainfall recharge for normal monsoon season rainfall estimated by the ground water level fluctuation method
R_{RF} (normal, rifm) =	Rainfall recharge for normal monsoon season rainfall estimated by the rainfall infiltration factor method

The rainfall recharge for normal monsoon season rainfall is finally adopted as per the criteria given below:

- If PD is greater than or equal to -20%, and less than or equal to +20%, R_{RF} (normal) is taken as the value estimated by the ground water level fluctuation method.
- If PD is less than -20%, R_{RF} (normal) is taken as equal to 0.8 times the value estimated by the rainfall infiltration factor method.
- If PD is greater than +20%, R_{RF} (normal) is taken as equal to 1.2 times the value estimated by the rainfall infiltration factor method.

2.1.1.2. Recharge from Other Sources

Recharge from other sources constitutes recharges from canals, surface water irrigation, ground water irrigation, tanks & ponds and water conservation structures in command areas where as in non-command areas it constitutes the recharge due to surface water irrigation, ground water irrigation, tanks & ponds and water conservation structures. The methods of estimation of recharge from different sources are as follows.

Sl. No.	Source	Estimation Formula	Parameters
1	Recharge from Canals	$R_C = WA \times SF \times Days$	R_C = Recharge from Canals WA = Wetted Area SF = Seepage Factor Days = Number of Canal Running Days
2	Recharge from Surface Water Irrigation	$R_{SWI} = AD \times Days \times RFF$	R_{SWI} = Recharge due to applied surface water irrigation AD = Average Discharge Days = Number of days water is discharged to the Fields RFF = Return Flow Factor
3	Recharge from Ground Water Irrigation	$R_{GWI} = GE_{IRR} \times RFF$	R_{GWI} = Recharge due to applied ground water irrigation GE_{IRR} = Ground Water Extraction for Irrigation RFF = Return Flow Factor

Sl. No.	Source	Estimation Formula	Parameters
4	Recharge due to Tanks & Ponds	$R_{TP} = AWSA \times N \times RF$	R_{TP} = Recharge due to Tanks & Ponds AWSA = Average Water Spread Area N = Number of days Water is available in the Tank/Pond RF = Recharge Factor
5	Recharge due to Water Conservation Structures	$R_{WCS} = GS \times RF$	RWCS = Recharge due to Water Conservation Structures GS = Gross Storage = Storage Capacity multiplied by number of fillings. RF = Recharge Factor

2.1.1.3. Lateral Flow Along the Aquifer System (Through Flow)

In equations 6 & 7, if the area under consideration is a watershed, the lateral flow across boundaries can be considered as zero in case such estimates are not available. If there is inflow and outflow across the boundary, theoretically, the net inflow may be calculated using Darcy law, by delineating the inflow and outflow sections of the boundary. Besides such delineation, the calculation also requires estimate of transmissivity and hydraulic gradient across the inflow and outflow sections. These calculations are most conveniently done in a computer model. It is recommended to initiate regional scale modelling with well-defined flow boundaries. Once the modelling is complete, the lateral flows (LF) across boundaries for any assessment unit can be obtained from the model. In case Lateral Flow is calculated using computer model, the same should be included in the water balance equation.

2.1.1.4. Base Flow and Stream Recharge

If stream gauge stations are located in the assessment unit, the base flow and recharge from streams can be computed using Stream Hydrograph Separation method, Numerical Modelling and Analytical solutions. If the assessment unit is a watershed, a single stream monitoring station at the mouth of the watershed can provide the required data for the calculation of base flow. Any other information on local-level base flows such as those collected by research centres, educational institutes or NGOs may also be used to improve the estimates on base flows.

Base flow separation methods can be divided into two main types: non-tracer-based and tracer-based separation methods. Non-tracer methods include Stream hydrograph analysis, water balance method and numerical ground water modelling techniques. Digital filters are available for separating base flow component of the stream hydrograph.

Hydro-chemical tracers and environmental isotope methods also use hydrograph separation techniques based on mass balance approach. Stream recharge can be computed either using modelling techniques or simply by applying the Darcy Law.

Base flow assessment and Stream recharge should be carried out in consultation with Central Water Commission in order to avoid any duplicity in the estimation of total water availability in a river basin.

2.1.1.5. Vertical Inter Aquifer Flow

This can be estimated provided aquifer geometry and aquifer parameters are known. This can be calculated using the Darcy's law if the hydraulic heads in both aquifers and the hydraulic conductivity and thickness of the aquitard separating both the aquifers are known. Ground water flow modelling is an important tool to estimate such flows. As envisaged in this report regional scale modelling studies will help in refining vertical inter aquifer flow estimate.

2.1.1.6. Evaporation and Transpiration

Evaporation can be estimated for the aquifer in the assessment unit if water levels in the aquifer are within the capillary zone. It is recommended to compute the evaporation through field studies. If field studies are not possible, for areas with water levels within 1.0mbgl, evaporation can be estimated using the evaporation rates available for other adjoining areas. If depth to water level is more than 1.0mbgl, the evaporation losses from the aquifer should be taken as zero.

Transpiration through vegetation can be estimated if water levels in the aquifer are within the maximum root zone of the local vegetation. It is recommended to compute the transpiration through field studies. Even though it varies from place to place depending on type of soil &vegetation, in the absence of field studies the following estimation can be followed. If water levels are within 3.5mbgl, transpiration can be estimated using the transpiration rates available for other areas. If it is greater than3.5m bgl, the transpiration should be taken as zero.

For estimating evapotranspiration, field tools like Lysimeters can be used to estimate actual evapotranspiration. Usually agricultural universities and IMD carry out lysimeter experiments and archive the evapotranspiration data. Remote sensing based techniques like SEBAL (Surface Energy Balance Algorithm for Land) can be used for estimation of actual evapotranspiration. Assessing offices may apply available lysimeter data or other techniques for estimation of evapotranspiration. In case where such data is not available, evapotranspiration losses can be empirically estimated from PET data provided by IMD.

2.1.1.7. Recharge During Monsoon Season

The sum of normalized monsoon rainfall recharge and the recharge from other sources and lateral and vertical flows into & out of the sub unit and stream inflows & outflows during monsoon season is the total recharge/ accumulation during monsoon season for the sub unit. Similarly, this is to be computed for all the sub units available in the assessment unit.

2.1.1.8. Recharge During Non-Monsoon Season

The rainfall recharge during non-monsoon season is estimated using rainfall infiltration factor Method only when the non-monsoon season rainfall is more than 10% of normal annual rainfall. The sum of non-monsoon rainfall recharge and the recharge from other sources and lateral and vertical flows into & out of the sub unit and stream inflows & outflows during non-monsoon season is the total recharge/ accumulation during non-monsoon season for the sub unit. Similarly, this is to be computed for all the sub units available in the assessment unit.

2.1.1.9. Total Annual Ground Water Recharge

The sum of the recharge/ accumulations during monsoon and non-monsoon seasons is the total annual ground water recharge/ accumulations for the sub unit. Similarly, this is to be computed for all the sub units available in the assessment unit.

2.1.1.10. Annual Extractable Ground Water Resource (EGR)

The Annual Extractable Ground Water Resource (EGR) is computed by deducting the Total Annual Natural Discharge from Total Annual Ground Water Recharge.

The ground water base flow contribution limited to the ecological flow of the river should be determined which will be deducted from Annual Ground Water Recharge to determine Annual Extractable Ground Water Resources (EGR). The ecological flows of the rivers are to be determined in consultation with Central Water Commission and other concerned river basin agencies. In case base flow contribution to the ecological flow of rivers is not determined then following assumption is to be followed.

In the water level fluctuation method, a significant portion of base flow is already accounted for by taking the post monsoon water level one month after the end of rainfall. The base flow in the remaining non-monsoon period is likely to be small, especially in hard rock areas. In the assessment units, where river stage data are not available and neither the detailed data for quantitative assessment of the natural discharge are available, present practice (GEC 1997) of allocation of unaccountable natural discharges to 5% or 10% of annual recharge may be retained. If the rainfall recharge is assessed using water level fluctuation method this will be 5% of the annual recharge and if it is assessed using rainfall infiltration factor method, it will be 10% of the annual recharge. The balance will account for Annual Extractable Ground Water Resources (EGR).

2.1.1.11. Estimation of Ground Water Extraction

Ground water draft or extraction is to be assessed as follows.

$$\boldsymbol{GE_{ALL} = GE_{IRR} + GE_{DOM} + GE_{IND}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (\mathbf{15})$$

Where,

GE_{ALL} = Ground water extraction for all uses
GE_{IRR} = Ground water extraction for irrigation
GE_{DOM} = Ground water extraction for domestic uses
GE_{IND} = Ground water extraction for industrial uses

2.1.1.11.1. Ground Water Extraction for Irrigation (GE_{IRR})

The methods for estimation of ground water extraction are as follows.

***Unit Draft Method:* –** In this method, season-wise unit draft of each type of well in an assessment unit is estimated. The unit draft of different types (eg. Dug well, Dug cum bore well, shallow tube well, deep tube well, bore well etc.) is multiplied with the number of wells of that particular type to obtain season-wise ground water extraction by that particular structure.

Crop Water Requirement Method: – For each crop, the season-wise net irrigation water requirement is determined. This is then multiplied with the area irrigated by ground water abstraction structures. The database on crop area is obtained from Revenue records in Tehsil office, Agriculture Census and also by using Remote Sensing techniques.

Power Consumption Method: –Ground water extraction for unit power consumption (electric) is determined. Extraction per unit power consumption is then multiplied with number of units of power consumed for agricultural pump sets to obtain total ground water extraction for irrigation.

2.1.1.11.2. Ground Water Extraction for Domestic Use (GE_{DOM})

There are several methods for estimation of extraction for domestic use(GEDOM). Some of the commonly adopted methods are described here.

Unit Draft Method: – In this method, unit draft of each type of well is multiplied by the number of wells used for domestic purpose to obtain the domestic ground water extraction.

Consumptive Use Method: – In this method, population is multiplied with per capita consumption usually expressed in litre per capita per day (lpcd). It can be expressed using following equation.

$$\boldsymbol{GE_{DOM} = Population \times ConsumptiveRequirement \times L_g} \dots\dots\dots\dots\dots.\dots\dots\dots\dots\dots\dots.(\mathbf{16})$$

Where,

L_g = Fractional Load on Ground Water for Domestic Water Supply.

The Load on Ground water can be obtained from the Information based on Civic water supply agencies in urban areas.

2.1.1.11.3. Ground Water Extraction for Industrial Use (GE_{IND})

The commonly adopted methods for estimating the extraction for industrial use are as below:

Unit Draft Method: - In this method, unit draft of each type of well is multiplied by the number of wells used for industrial purpose to obtain the industrial ground water extraction.

Consumptive Use Pattern Method: – In this method, water consumption of different industrial units is determined. Numbers of Industrial units which are dependent on ground water are multiplied with unit water consumption to obtain ground water extraction for industrial use.

$$\boldsymbol{GE_{IND} = NumberofIndustrialUnits \times UnitWaterConsumption \times L_g} \dots\dots\dots..\dots\dots\dots.(\mathbf{17})$$

Where,

L_g = Fractional load on ground water for industrial water supply.

The load on ground water for industrial water supply can be obtained from water supply agencies in the Industrial belt.

Ground water extraction obtained from different methods need to be compared and based on field checks, the seemingly best value may be adopted. At times, ground water extraction obtained by different methods may vary widely. In such cases, the value matching the field situation should be considered. The storage depletion during a season, where other recharges are negligible can be taken as ground water extraction during that particular period.

2.1.1.12. Stage of Ground Water Extraction

The stage of ground water extraction is defined by,

$$\boldsymbol{Stage of GW Extraction} = \frac{\boldsymbol{Existing Gross GW Extraction for all Uses}}{\boldsymbol{Annual Extractable GW Resources}} \times \mathbf{100} \ldots\ldots\ldots\ldots\ldots (\mathbf{18})$$

The existing gross ground water extraction for all uses refers to the total of existing gross ground water extraction for irrigation and all other purposes. The stage of ground water extraction should be obtained separately for command areas, non-command areas and poor ground water quality areas.

2.1.1.13. Validation of Stage of Ground Water Extraction

The assessment based on the stage of ground water extraction has inherent uncertainties. In view of this, it is desirable to validate the 'Stage of Ground Water Extraction' with long term trend of ground water levels.

Long term Water Level trends are prepared for a minimum period of 10 years for both pre-monsoon and post-monsoon period. If the ground water resource assessment and the trend of long term water levels contradict each other, this anomalous situation requires a review of the ground water resource computation, as well as the reliability of water level data. The mismatch conditions are enumerated below.

SOGWE	Ground Water Level Trend	Remarks
≤ 70%	Significant decline in trend in both pre-monsoon and post-monsoon	Not acceptable and needs reassessment
> 100%	No significant decline in both pre-monsoon and post-monsoon long term trend	Not acceptable and needs reassessment

2.1.1.14. Categorisation of Assessment Unit

As emphasised in the National Water Policy, 2012, a convergence of Quantity and Quality of ground water resources is required while assessing the ground water status in an assessment unit. Therefore, it is recommended to separate estimation of resources where water quality is beyond permissible limits for the parameter salinity.

2.1.1.14.1. Categorisation of Assessment Unit Based on Quantity

The categorisation based on status of ground water quantity is defined by Stage of Ground Water Extraction as given below:

Stage of Ground Water Extraction	Category
≤ 70%	Safe
> 70% and ≤90%	Semi-critical
> 90% and ≤100%	Critical
> 100%	Over Exploited

2.1.1.14.2. Categorisation of Assessment Unit Based on Quality

As it is not possible to categorize the assessment units in terms of the extent of quality hazard, based on the available water quality monitoring mechanism and database on ground water quality, the Committee recommends that each assessment unit, in addition to the Quantity based categorization (safe, semi-critical, critical and over-exploited) should bear a quality hazard identifier. If any of the three quality hazards in terms of Arsenic, Fluoride and Salinity are encountered in the assessment sub unit in mappable units, the assessment sub unit may be tagged with the particular Quality hazard.

2.1.1.15. Allocation of Ground Water Resource for Utilisation

The Annual Extractable Ground Water Resources are to be apportioned between domestic, industrial and irrigation uses. Among these, as per the National Water Policy, requirement for domestic water supply is to be accorded priority. This requirement has to be based on population as projected to the year 2025, per capita requirement of water for domestic use, and relative load on ground water for urban and rural water supply. In situations where adequate data is not available to make this estimate, the following empirical relation is recommended.

$$\boldsymbol{Alloc = 22 \times N \times L_g mmperyear} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(19)}$$

Where,

Alloc = Allocation for domestic water requirement

N = population density in the unit in thousands per sq. km.

L_g= fractional load on ground water for domestic water supply (≤ 1.0)

In deriving equation (19), it is assumed that the requirement of water for domestic use is 60 lpd per head. The equation can be suitably modified in case per capita requirement is different. If by chance, the estimation of projected allocation for future domestic needs is less than the current domestic extraction due to any reason, the allocation must be equal to the present day extraction. It can never be less than the present day extraction as it is unrealistic.

2.1.1.16. Net Annual Ground Water Availability for Future Use

The water available for future use is obtained by deducting the allocation for domestic use and current extraction for Irrigation and Industrial uses from the Annual Extractable Ground Water Recharge. The resulting ground water potential is termed as the net annual ground water availability for future use. The Net annual ground water availability for future use should be calculated separately for non-command areas and command areas. As per the recommendations of the R&D Advisory committee, the ground water available for future use can never be negative. If it becomes negative, the future allocation of Domestic needs can be reduced to current extraction for domestic use. Even then if it is still negative, then the ground water available for future uses will be zero.

2.1.1.17. Additional Potential Resources under Specific Conditions

2.1.1.17.1. Potential Resource Due to Spring Discharge

Spring discharge occurs at the places where ground water level cuts the surface topography. The spring discharge is equal to the ground water recharge minus the outflow through evaporation and evapotranspiration and vertical and lateral sub-surface flow. Thus, Spring Discharge is a form of

'Annual Extractable Ground Water Recharge'. It is a renewable resource, though not to be used for Categorisation. Spring discharge measurement is to be carried out by volumetric measurement of discharge of the springs. Spring discharges multiplied with time in days of each season will give the quantum of spring resources available during that season. The committee recommends that in hilly areas with substantial potential of spring discharges, the discharge measurement should be made at least 4 times a year in parity with the existing water level monitoring schedule.

$$\boldsymbol{Potential ground water resource due to springs = Q \times No. of days} \ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{20})$$

Where,

Q = Spring Discharge

No of days = No of days spring yields.

2.1.1.17.2. Potential Resource in Waterlogged and Shallow Water Table Areas

In the area where the ground water level is less than 5m below ground level or in waterlogged areas, the resources up to 5m below ground level are potential and would be available for development in addition to the annual recharge in the area. The computation of potential resource to ground water reservoir in shallow water table areas can be done by adopting the following equation:

$$\boldsymbol{Potential ground water resource in shallow water table areas = (5 - D) \times A \times S_Y} \ldots\ldots\ldots\ldots (\mathbf{21})$$

Where,

D = Depth to water table below ground surface in pre-monsoon period in shallow aquifers.

A = Area of shallow water table zone.

S_Y = Specific Yield

2.1.1.17.3. Potential Resource in Flood Prone Areas

Ground water recharge from a flood plain is mainly the function of the following parameters-

- Areal extent of flood plain
- Retention period of flood
- Type of sub-soil strata and silt charge in the river water which gets deposited and controls seepage

Since collection of data on all these factors is time taking and difficult, in the meantime, the potential resource from flood plain may be estimated on the same norms as for ponds, tanks and lakes. This has to be calculated over the water spread area and only for the retention period using the following formula.

$$\boldsymbol{Potential ground water resource in Flood Prone Areas = 1.4 \times N \times \frac{A}{1000}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{22})$$

Where,

N = No. of Days Water is Retained in the Area

A = Flood Prone Area

2.1.1.18. Apportioning of Ground Water Assessment from Watershed to Development Unit

Where the assessment unit is a watershed, there is a need to convert the ground water assessment in terms of an administrative unit such as block/ taluka/ mandal. This may be done as follows.

A block may comprise of one or more watersheds, in part or full. First, the ground water assessment in the subareas, command, non-command and poor ground water quality areas of the watershed may be converted into depth unit (mm), by dividing the annual recharge by the respective area. The contribution of this subarea of the watershed to the block, is now calculated by multiplying this depth with the area in the block occupied by this sub-area. This procedure must be followed to calculate the contribution from the sub-areas of all watersheds occurring in the block, to work out the total ground water resource of the block.

The total ground water resource of the block should be presented separately for each type of sub-area, namely for command areas, non-command areas and poor ground water quality areas, as in the case of the individual watersheds.

2.1.2. Assessment of In-Storage Ground Water Resources or Static Ground Water Resources

The computation of the static or in-storage ground water resources may be done after delineating the aquifer thickness and specific yield of the aquifer material. The computations can be done as follows: -

$$\boldsymbol{SGWR = A \times (Z_2 - Z_1) \times S_Y} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (\mathbf{23})$$

Where,

SGWR = Static or in-storage ground water resources

A = Area of the assessment unit

Z_2= Bottom of unconfined aquifer

Z_1= Pre-monsoon water level

S_Y= Specific yield in the in-storage zone

2.1.3. Assessment of Total Ground Water Availability in Unconfined Aquifer

The sum of Annual Exploitable Ground Water Resource and the In-storage Ground Water Resources of an unconfined aquifer is the Total Ground Water Availability of that aquifer.

2.2. GROUND WATER ASSESSMENT OF CONFINED AQUIFER SYSTEM

The assessment of the ground water resources of the confined aquifers is done by following ground water storage approach. If the areal extent of the confined aquifer is “A” then the total quantity of water added to or released from the entire aquifer is

$$\boldsymbol{Q = S \times A \times \Delta h} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (\mathbf{24})$$

Where,

Q = Quantity of water confined aquifer can release (m^3)

S = Storativity

A = Areal extent of the confined aquifer (m^2)

Δh = Change in Piezometric head (m)

Once the piezometric head reaches below the top confining bed, it behaves like an unconfined aquifer and directly dewaters the aquifer and there is a possibility of damage to the aquifer as well as topography. The quantity of water released in confined aquifer due to change in pressure can be computed between piezometric head (ht) at any given time 't' and the bottom of the top confining layer (ho) by using the following equation.

$$\boldsymbol{Q_P = S \times A \times \Delta h = S \times A \times (h_t - h_0)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(25)}$$

Where,

Q_P= Ground Water Potential of Confined Aquifer
S= Storativity
A = Areal extent of the confined aquifer
Δh = Change in Piezometric head
h_t= Piezometric head at any particular time
h_0= Bottom of the top Confining Layer

If any development activity is started in the confined aquifer, the assessment is done for both the dynamic as well as in-storage resources of the confined aquifer.

2.2.1. Dynamic Ground Water Resources of Confined Aquifer

To assess the dynamic ground water resources of the confined aquifer the following equation can be used with the pre and post monsoon piezometric heads of the particular aquifer.

$$\boldsymbol{Q_D = S \times A \times \Delta h = S \times A \times (h_{POST} - h_{PRE})} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(26)}$$

Where,

Q_D= Dynamic Ground Water Resource of Confined Aquifer (m^3)
S = Storativity
A = Areal extent of the confined aquifer (m^2)
Δh = Change in piezometric head (m)
h_{POST} = Piezometric head during post-monsoon period (mamsl)
h_{PRE} = Piezometric head during pre-monsoon period (m amsl)

2.2.2. In-storage Ground Water Resources of Confined Aquifer

For assessing the in- storage ground water potential of a confined aquifer, one has to compute the resources between the pre-monsoon piezometric head and bottom of the top confining layer. That can be assessed using the following formula:

$$\boldsymbol{Q_I = S \times A \times \Delta h = S \times A \times (h_{PRE} - h_0)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(27)}$$

Where,

Q_I=In-storage Ground Water Resource of Confined Aquifer (m^3)
S = Storativity
A = Areal extent of the confined aquifer (m^2)
Δh = Change in piezometric head (m)
h_0= Bottom level of the top confining layer (m amsl)
h_{PRE}= Piezometric head during pre-monsoon period (m amsl)

If the confined aquifer is not being exploited for any purpose, the dynamic and static resources of the confined aquifer need not be estimated separately. Instead the in-storage ground water resource of the aquifer can be computed using the following formula.

$$\boldsymbol{Q_P} = \boldsymbol{S} \times \boldsymbol{A} \times \Delta \boldsymbol{h} = \boldsymbol{S} \times \boldsymbol{A} \times (\boldsymbol{h_{POST}} - \boldsymbol{h_0}) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.. (\mathbf{28})$$

Where,

Q_P= In-storage Ground Water Resource of Confined Aquifer or the quantity of water under pressure (m^3)

S = Storativity

A = Areal extent of the confined aquifer (m^2)

Δh = Change in piezometric head (m)

h_0= Bottom level of the top confining layer (m amsl)

h_{POST} = Piezometric head during post-monsoon period (m amsl)

The calculated resource includes small amount of dynamic resource of the confined aquifer also, which replenishes every year. But to make it simpler this was also computed as part of the static or in-storage resource of the confined aquifer.

2.2.3. Assessment of Total Ground Water Availability of Confined Aquifer

If the confined aquifer is being exploited, the Total Ground Water Availability of the confined aquifer is the sum of Dynamic Ground Water Resources and the In-storage Ground Water Resources of that confined aquifer whereas if it is not being exploited, the Total Ground Water Availability of the confined aquifer comprises of only one component i.e. the In-storage Ground Water Resources of that confined aquifer.

2.3. GROUND WATER ASSESSMENT OF SEMI-CONFINED AQUIFER SYSTEM

The Assessment of Ground Water Resources of a semi-confined aquifer has some more complications. Unless and until, it is well studied that the recharge to this is not computed either in the over lying unconfined aquifer or underlying/overlying semi confined aquifers, it should not be assessed separately. If it is assessed separately, there is a possibility of duplication of estimating the same resource by direct computation in one aquifer and as leakage in the other aquifer. As it is advisable to under estimate rather than to overestimate the resources, it is recommended not to assess these resources separately as long as there is no study indicating its non-estimation. If it is found through field studies that the resources are not assessed in any of the aquifers in the area, these resources are to be assessed following the methodology similar to that used in assessing the resources of Confined aquifers.

2.4. TOTAL GROUND WATER AVAILABILITY OF AN AREA

The Total Ground Water Availability in any area is the sum of dynamic and static/in-storage ground water resources in the unconfined aquifer and the dynamic and In-storage ground water resources of the Confined aquifers and semi confined aquifers in the area.

2.5. GROUND WATER ASSESSMENT IN URBAN AREAS

The Assessment of Ground Water Resources in urban areas is similar to that of rural areas. Because of the availability of draft data and slightly different infiltration process and recharge due to other sources, the following few points are to be considered.

- Even though the data on existing ground water abstraction structures are available, accuracy is somewhat doubtful and individuals cannot even enumerate the well census in urban areas. Hence it is recommended to use the difference of the actual demand and the supply by surface water sources as the withdrawal from the ground water resources.

- The urban areas are sometimes concrete jungles and rainfall infiltration is not equal to that of rural areas unless and until special measures are taken in the construction of roads and pavements. Hence, it is proposed to use 30% of the rainfall infiltration factor proposed for urban areas as an adhoc arrangement till field studies in these areas are done and documented field studies are available.

- Because of the water supply schemes, there are many pipelines available in the urban areas and the seepages from these channels or pipes are huge in some areas. Hence this component is also to be included in the other resources and the recharge may be estimated. The percent losses may be collected from the individual water supply agencies, 50% of which can be taken as recharge to the ground water system.

- In the urban areas in India, normally, there is no separate channels either open or sub surface for the drainage and flash floods. These channels also recharge to some extent the ground water reservoir. As on today, there is no documented field study to assess the recharge. The seepages from the sewerages, which normally contaminate the ground water resources with nitrate also contribute to the quantity of resources and hence same percent as in the case of water supply pipes may be taken as norm for the recharge on the quantity of sewerage when there is sub surface drainage system. If estimated flash flood data is available the same percent can be used on the quantum of flash floods to estimate the recharge from the flash floods. Even when the drainage system is open channels, till further documented field studies are done same procedure may be followed.

- It is proposed to have a separate ground water assessment for urban areas with population more than 10 lakhs.

2.6. GROUND WATER ASSESSMENT IN COASTAL AREAS

The assessment of ground water resources in coastal areas is similar to that of other areas. Because of the nature of hydraulic equilibrium of ground water with sea water, care should be taken in assessing the ground water resources of this area. While assessing the resources in these areas, following few points are to be considered.

- The ground water resources assessment in coastal areas includes the areas where the influence of sea water has an effect on the existence of fresh water in the area. It can be demarcated from the Coastal Regulatory zone or the Geomorphological maps or from the maps where sea water influences are demarcated.

- Wherever, the pre monsoon and post monsoon water levels are above mean sea level the dynamic component of the estimation will be same as other areas.
- If both these water levels are below sea level, the dynamic component should be taken as zero.
- Wherever, the post monsoon water table is above sea level and pre monsoon water table is below sea level the pre monsoon water table should be taken as at sea level and fluctuation is to be computed.
- The static or in storage resources are to be restricted to the minimum of 40 times the pre monsoon water table or the bottom of the aquifer.

2.7. GROUND WATER ASSESSMENT IN WATER LEVEL DEPLETION ZONES

There may be areas where ground water level shows a decline even in the monsoon season. The reasons for this may be any one of the following : (a) There is a genuine depletion in the ground water regime, with ground water extraction and natural ground water discharge in the monsoon season(outflow from the region and base flow) exceeding the recharge. (b) There may be an error in water level data due to inadequacy of observation wells.

If it is concluded that the water level data is erroneous, recharge assessment may be made based on rainfall infiltration factor method. If, on the other hand, water level data is assessed as reliable, the ground water level fluctuation method may be applied for recharge estimation. As ΔS in equation 3& 4 is negative, the estimated recharge will be less than the gross ground water extraction in the monsoon season. It must be noted that this recharge is the gross recharge minus the natural discharges in the monsoon season. The immediate conclusion from such an assessment in water depletion zones will be that the area falls under the over-exploited category which requires micro level study.

2.8. NORMS TO BE USED IN THE ASSESSMENT

The committee recommends that the state agencies should be encouraged to conduct field studies and use these computed norms in the assessment. For conducting field studies, it is recommended to follow the field-tested procedures for computing the norms. There is the possibility of error creeping in at various levels in the field study and hence the committee is of the opinion to give a maximum and minimum values for all the norms used in the estimation. The committee can foresee the handicap of the state agencies which are not able to compute the norms by their own field study. In such cases, it suggests an average of the range of norms to be used as the recommended value for the norm.

2.8.1. Specific Yield

Recently under Aquifer Mapping Project, Central Ground Water Board has classified all the aquifers into 16 Principal Aquifers which in turn were divided into 42 Major Aquifers. Hence, it is required to assign Specific Yield values to all these aquifer units. The values recommended in the ***Table-2.1*** may be followed in the future assessments. The Major aquifer map can be obtained from Regional offices of Central Ground Water Board.

The recommended Specific Yield values are to be used for assessment, unless sufficient data based on field studies are available to justify the minimum, maximum or other intermediate values. The Norms suggested below are nothing but the redistribution of norms suggested by GEC-1997 methodology and hence people are encouraged to conduct field studies and strengthen the Norms database.

Table-2.1: Norms Recommended for Specific Yield

Sl. No.	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
1	Alluvium	AL01	Younger Alluvium (Clay/Silt/Sand/ Calcareous concretions)	Quaternary	10	8	12
2	Alluvium	AL02	Pebble / Gravel/ Bazada/ Kandi	Quaternary	16	12	20
3	Alluvium	AL03	Older Alluvium (Silt/Sand/Gravel/Lithomargic clay)	Quaternary	6	4	8
4	Alluvium	AL04	Aeolian Alluvium (Silt/ Sand)	Quaternary	16	12	20
5	Alluvium	AL05	Coastal Alluvium (Sand/Silt/Clay)	Quaternary	10	8	12
6	Alluvium	AL06	Valley Fills	Quaternary	16	12	20
7	Alluvium	AL07	Glacial Deposits	Quaternary	16	12	20
8	Laterite	LT01	Laterite / Ferruginous concretions	Quaternary	2.5	2	3
9	Basalt	BS01	Basic Rocks (Basalt) - Weathered, Vesicular or Jointed	Mesozoic to Cenozoic	2	1	3
10	Basalt	BS01	Basic Rocks (Basalt) - Massive Poorly Jointed	Mesozoic to Cenozoic	0.35	0.2	0.5
11	Basalt	BS02	Ultra Basic - Weathered, Vesicular or Jointed	Mesozoic to Cenozoic	2	1	3
12	Basalt	BS02	Ultra Basic - Massive Poorly Jointed	Mesozoic to Cenozoic	0.35	0.2	0.5
13	Sandstone	ST01	Sandstone/Conglomerate	Upper Palaeozoic to Cenozoic	3	1	5
14	Sandstone	ST02	Sandstone with Shale	Upper Palaeozoic to Cenozoic	3	1	5
15	Sandstone	ST03	Sandstone with shale/ coal beds	Upper Palaeozoic to Cenozoic	3	1	5
16	Sandstone	ST04	Sandstone with Clay	Upper Palaeozoic to Cenozoic	3	1	5
17	Sandstone	ST05	Sandstone/Conglomerate	Proterozoic to Cenozoic	3	1	5
18	Sandstone	ST06	Sandstone with Shale	Proterozoic to	3	1	5

Sl. No.	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
				Cenozoic			
19	Shale	SH01	Shale with limestone	Upper Palaeozoic to Cenozoic	1.5	1	2
20	Shale	SH02	Shale with Sandstone	Upper Palaeozoic to Cenozoic	1.5	1	2
21	Shale	SH03	Shale, limestone and sandstone	Upper Palaeozoic to Cenozoic	1.5	1	2
22	Shale	SH04	Shale	Upper Palaeozoic to Cenozoic	1.5	1	2
23	Shale	SH05	Shale/Shale with Sandstone	Proterozoic to Cenozoic	1.5	1	2
24	Shale	SH06	Shale with Limestone	Proterozoic to Cenozoic	1.5	1	2
25	Limestone	LS01	Miliolitic Limestone	Quarternary	2	1	3
26	Limestone	LS01	KarstifiedMiliolitic Limestone	Quarternary	10	5	15
27	Limestone	LS02	Limestone / Dolomite	Upper Palaeozoic to Cenozoic	2	1	3
28	Limestone	LS02	Karstified Limestone / Dolomite	Upper Palaeozoic to Cenozoic	10	5	15
29	Limestone	LS03	Limestone/Dolomite	Proterozoic	2	1	3
30	Limestone	LS03	Karstified Limestone/Dolomite	Proterozoic	10	5	15
31	Limestone	LS04	Limestone with Shale	Proterozoic	2	1	3
32	Limestone	LS04	Karstified Limestone with Shale	Proterozoic	10	5	15
33	Limestone	LS05	Marble	Azoic to Proterozoic	2	1	3
34	Limestone	LS05	Karstified Marble	Azoic to Proterozoic	10	5	15
35	Granite	GR01	Acidic Rocks (Granite,Syenite, Rhyolite etc.) - Weathered , Jointed	Mesozoic to Cenozoic	1.5	1	2
36	Granite	GR01	Acidic Rocks (Granite,Syenite, Rhyolite etc.)-Massive or Poorly Fractured	Mesozoic to Cenozoic	0.35	0.2	0.5
37	Granite	GR02	Acidic Rocks (Pegmatite, Granite, Syenite, Rhyolite etc.) - Weathered, Jointed	Proterozoic to Cenozoic	3	2	4
38	Granite	GR02	Acidic Rocks (Pegmatite, Granite, Syenite, Rhyolite etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	0.35	0.2	0.5
39	Schist	SC01	Schist - Weathered, Jointed	Azoic to Proterozoic	1.5	1	2
40	Schist	SC01	Schist - Massive, Poorly Fractured	Azoic to Proterozoic	0.35	0.2	0.5
41	Schist	SC02	Phyllite	Azoic to Proterozoic	1.5	1	2
42	Schist	SC03	Slate	Azoic to Proterozoic	1.5	1	2
43	Quartzite	QZ01	Quartzite - Weathered, Jointed	Proterozoic to Cenozoic	1.5	1	2

Sl. No.	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
44	Quartzite	QZ01	Quartzite - Massive, Poorly Fractured	Proterozoic to Cenozoic	0.3	0.2	0.4
45	Quartzite	QZ02	Quartzite - Weathered, Jointed	Azoic to Proterozoic	1.5	1	2
46	Quartzite	QZ02	Quartzite- Massive, Poorly Fractured	Azoic to Proterozoic	0.3	0.2	0.4
47	Charnockite	CK01	Charnockite - Weathered, Jointed	Azoic	3	2	4
48	Charnockite	CK01	Charnockite - Massive, Poorly Fractured	Azoic	0.3	0.2	0.4
49	Khondalite	KH01	Khondalites, Granulites - Weathered, Jointed	Azoic	1.5	1	2
50	Khondalite	KH01	Khondalites, Granulites - Mssive, Poorly Fractured	Azoic	0.3	0.2	0.4
51	Banded Gneissic Complex	BG01	Banded Gneissic Complex - Weathered, Jointed	Azoic	1.5	1	2
52	Banded Gneissic Complex	BG01	Banded Gneissic Complex - Massive, Poorly Fractured	Azoic	0.3	0.2	0.4
53	Gneiss	GN01	Undifferentiated metasedimentaries/ Undifferentiated metamorphic - Weathered, Jointed	Azoic to Proterozoic	1.5	1	2
54	Gneiss	GN01	Undifferentiated metasedimentaries/ Undifferentiated metamorphic - Massive, Poorly Fractured	Azoic to Proterozoic	0.3	0.2	0.4
55	Gneiss	GN02	Gneiss -Weathered, Jointed	Azoic to Proterozoic	3	2	4
56	Gneiss	GN02	Gneiss-Massive, Poorly Fractured	Azoic to Proterozoic	0.3	0.2	0.4
57	Gneiss	GN03	Migmatitic Gneiss - Weathered, Jointed	Azoic	1.5	1	2
58	Gneiss	GN03	Migmatitic Gneiss - Massive, Poorly Fractured	Azoic	0.3	0.2	0.4
59	Intrusive	IN01	Basic Rocks (Dolerite, Anorthosite etc.) - Weathered, Jointed	Proterozoic to Cenozoic	2	1	3
60	Intrusive	IN01	Basic Rocks (Dolerite, Anorthosite etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	0.35	0.2	0.5
61	Intrusive	IN02	Ultrabasics (Epidiorite, Granophyre etc.) - Weathered, Jointed	Proterozoic to Cenozoic	2	1	3
62	Intrusive	IN02	Ultrabasics (Epidiorite, Granophyre etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	0.35	0.2	0.5

2.8.2. Rainfall Infiltration Factor

It is recommended that to assign Rainfall Infiltration Factor values to all the aquifer units recently classified by the Central Ground Water Board. The values recommended in ***Table-2.2*** may be followed in the future assessments. The recommended Rainfall Infiltration Factor values are to be used for assessment, unless sufficient data based on field studies are available to justify the minimum, maximum or other intermediate values.

An additional 2% of rainfall recharge factor may be used in such areas or parts of the areas where watershed development with associated soil conservation measures are implemented. This additional factor is subjective and is separate from the contribution due to the water conservation structures such as check dams, nalla bunds, percolation tanks etc. The norms for the estimation of recharge due to these structures are provided separately. This additional factor of 2% is at this stage, only provisional, and will need revision based on pilot studies.

The Norms suggested below are nothing but the redistribution of norms suggested by GEC-1997 methodology and hence people are encouraged to conduct field studies and strengthen the Norms database.

Table-2.2: Norms Recommended for Rainfall Infiltration Factor

Sl. No.	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
1	Alluvium	AL01	Younger Alluvium (Clay/Silt/Sand/ Calcareous concretions)	Quaternary	22	20	24
2	Alluvium	AL02	Pebble / Gravel/ Bazada/ Kandi	Quaternary	22	20	24
3	Alluvium	AL03	Older Alluvium (Silt/Sand/Gravel/Lithomargic clay)	Quaternary	22	20	24
4	Alluvium	AL04	Aeolian Alluvium (Silt/ Sand)	Quaternary	22	20	24
5	Alluvium	AL05	Coastal Alluvium (Sand/Silt/Clay) -East Coast	Quaternary	16	14	18
5	Alluvium	AL05	Coastal Alluvium (Sand/Silt/Clay) - West Coast	Quaternary	10	8	12
6	Alluvium	AL06	Valley Fills	Quaternary	22	20	24
7	Alluvium	AL07	Glacial Deposits	Quaternary	22	20	24
8	Laterite	LT01	Laterite / Ferruginous concretions	Quaternary	7	6	8
9	Basalt	BS01	Basic Rocks (Basalt) - Vesicular or Jointed	Mesozoic to Cenozoic	13	12	14
9	Basalt	BS01	Basic Rocks (Basalt) - Weathered	Mesozoic to Cenozoic	7	6	8
10	Basalt	BS01	Basic Rocks (Basalt) - Massive Poorly Jointed	Mesozoic to Cenozoic	2	1	3
11	Basalt	BS02	Ultra Basic - Vesicular or Jointed	Mesozoic to Cenozoic	13	12	14
11	Basalt	BS02	Ultra Basic - Weathered	Mesozoic to Cenozoic	7	6	8
12	Basalt	BS02	Ultra Basic - Massive Poorly	Mesozoic to	2	1	3

Sl. No.	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
			Jointed	Cenozoic			
13	Sandstone	ST01	Sandstone/Conglomerate	Upper Palaeozoic to Cenozoic	12	10	14
14	Sandstone	ST02	Sandstone with Shale	Upper Palaeozoic to Cenozoic	12	10	14
15	Sandstone	ST03	Sandstone with shale/ coal beds	Upper Palaeozoic to Cenozoic	12	10	14
16	Sandstone	ST04	Sandstone with Clay	Upper Palaeozoic to Cenozoic	12	10	14
17	Sandstone	ST05	Sandstone/Conglomerate	Proterozoic to Cenozoic	6	5	7
18	Sandstone	ST06	Sandstone with Shale	Proterozoic to Cenozoic	6	5	7
19	Shale	SH01	Shale with limestone	Upper Palaeozoic to Cenozoic	4	3	5
20	Shale	SH02	Shale with Sandstone	Upper Palaeozoic to Cenozoic	4	3	5
21	Shale	SH03	Shale, limestone and sandstone	Upper Palaeozoic to Cenozoic	4	3	5
22	Shale	SH04	Shale	Upper Palaeozoic to Cenozoic	4	3	5
23	Shale	SH05	Shale/Shale with Sandstone	Proterozoic to Cenozoic	4	3	5
24	Shale	SH06	Shale with Limestone	Proterozoic to Cenozoic	4	3	5
25	Limestone	LS01	Miliolitic Limestone	Quarternary	6	5	7
27	Limestone	LS02	Limestone / Dolomite	Upper Palaeozoic to Cenozoic	6	5	7
29	Limestone	LS03	Limestone/Dolomite	Proterozoic	6	5	7
31	Limestone	LS04	Limestone with Shale	Proterozoic	6	5	7
33	Limestone	LS05	Marble	Azoic to Proterozoic	6	5	7
35	Granite	GR01	Acidic Rocks (Granite,Syenite, Rhyolite etc.) - Weathered , Jointed	Mesozoic to Cenozoic	7	5	9
36	Granite	GR01	Acidic Rocks (Granite,Syenite, Rhyolite etc.)-Massive or Poorly Fractured	Mesozoic to Cenozoic	2	1	3
37	Granite	GR02	Acidic Rocks (Pegmatite, Granite, Syenite, Rhyolite etc.) - Weathered, Jointed	Proterozoic to Cenozoic	11	10	12
38	Granite	GR02	Acidic Rocks (Pegmatite, Granite, Syenite, Rhyolite etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	2	1	3
39	Schist	SC01	Schist - Weathered, Jointed	Azoic to Proterozoic	7	5	9
40	Schist	SC01	Schist - Massive, Poorly Fractured	Azoic to Proterozoic	2	1	3
41	Schist	SC02	Phyllite	Azoic to Proterozoic	4	3	5
42	Schist	SC03	Slate	Azoic to Proterozoic	4	3	5
43	Quartzite	QZ01	Quartzite - Weathered, Jointed	Proterozoic to Cenozoic	6	5	7
44	Quartzite	QZ01	Quartzite - Massive, Poorly	Proterozoic to	2	1	3

Sl. No.	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
			Fractured	Cenozoic			
45	Quartzite	QZ02	Quartzite - Weathered, Jointed	Azoic to Proterozoic	6	5	7
46	Quartzite	QZ02	Quartzite- Massive, Poorly Fractured	Azoic to Proterozoic	2	1	3
47	Charnockite	CK01	Charnockite - Weathered, Jointed	Azoic	5	4	6
48	Charnockite	CK01	Charnockite - Massive, Poorly Fractured	Azoic	2	1	3
49	Khondalite	KH01	Khondalites, Granulites - Weathered, Jointed	Azoic	7	5	9
50	Khondalite	KH01	Khondalites, Granulites - Mssive, Poorly Fractured	Azoic	2	1	3
51	Banded Gneissic Complex	BG01	Banded Gneissic Complex - Weathered, Jointed	Azoic	7	5	9
52	Banded Gneissic Complex	BG01	Banded Gneissic Complex - Massive, Poorly Fractured	Azoic	2	1	3
53	Gneiss	GN01	Undifferentiated metasedimentaries/ Undifferentiated metamorphic - Weathered, Jointed	Azoic to Proterozoic	7	5	9
54	Gneiss	GN01	Undifferentiated metasedimentaries/ Undifferentiated metamorphic - Massive, Poorly Fractured	Azoic to Proterozoic	2	1	3
55	Gneiss	GN02	Gneiss -Weathered, Jointed	Azoic to Proterozoic	11	10	12
56	Gneiss	GN02	Gneiss-Massive, Poorly Fractured	Azoic to Proterozoic	2	1	3
57	Gneiss	GN03	Migmatitic Gneiss - Weathered, Jointed	Azoic	7	5	9
58	Gneiss	GN03	Migmatitic Gneiss - Massive, Poorly Fractured	Azoic	2	1	3
59	Intrusive	IN01	Basic Rocks (Dolerite, Anorthosite etc.) - Weathered, Jointed	Proterozoic to Cenozoic	7	6	8
60	Intrusive	IN01	Basic Rocks (Dolerite, Anorthosite etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	2	1	3
61	Intrusive	IN02	Ulrta Basics (Epidiorite, Granophyre etc.) - Weathered, Jointed	Proterozoic to Cenozoic	7	6	8
62	Intrusive	IN02	Ulrta Basics (Epidiorite, Granophyre etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	2	1	3

2.8.3. Norms for Canal Recharge

Unlike other norms, the Recharge factor for calculating recharge due to canals is given in two units viz. ham/million $m^2$of wetted area/day and cumecs per million $m^2$of wetted area. As all other norms are in ham, the committee recommends the norm in ham/million m^2 of wetted area for computing the recharge due to canals.

There is a wide variation in the values of the recharge norms proposed by GEC 1997.The Canal seepage norm is approximately 150 times the other recharge norms. In the absence of any field studies to refine the norms it is decided by the committee to continue with the same norms. The committee strongly recommends that each state agency must conduct one filed study at least one in each district before completing the first assessment using this methodology. The committee also suggests a recommended value and minimum and maximum values as in the case of other norms. Where specific results are available from case studies in some states, the adhoc norms are to be replaced by norms evolved from these results.

The Norms suggested in ***Table-2.3*** below are nothing but the rationalization and redistribution of norms suggested by GEC-1997 methodology and hence people are encouraged to conduct field studies and strengthen the Norms database.

Table-2.3: Norms Recommended for Recharge due to Canals

Formation	Canal Seepage factor ham/day/million square meters of wetted area		
	Recommended	Minimum	Maximum
Unlined canals in normal soils with some clay content along with sand	17.5	15	20
Unlined canals in sandy soil with some silt content	27.5	25	30
Lined canals in normal soils with some clay content along with sand	3.5	3	4
Lined canals in sandy soil with some silt content	5.5	5	6
All canals in hard rock area	3.5	3	4

2.8.4. Norms for Recharge Due to Irrigation

The Norms Suggested by GEC-1997 gives for only three ranges of water levels and it creates a problem in the boundary conditions. For instance, as a result of the variation in water level from 24.9 to 25.1m bgl in the adjoining blocks, change occurs in the return flow from irrigation in the range of 10% to 15%. Hence to reduce the discrepancy it is recommended to have linear relationship of the norms in between 10m bgl water level and 25m bgl water level. It is proposed to have the same norm of 10m bgl zone for all the water levels less than 10m. Similarly, the norm recommended for 25m may be used for the water levels more than 25m as well. The Recommended Norms are presented in ***Table-2.4***.

For surface water, the recharge is to be estimated based on water released at the outlet. For ground water, the recharge is to be estimated based on gross draft. Where continuous supply is used instead of rotational supply, an additional recharge of 5% of application may be used.

Where specific results are available from case studies in some states, the adhoc norms are to be replaced by norms evolved from these results.

Table-2.4: Norms Recommended for Recharge from Irrigation

DTW m bgl	Ground Water		Surface Water	
	Paddy	Non-paddy	Paddy	Non-paddy
≤ 10	45.0	25.0	50.0	30.0
11	43.3	23.7	48.3	28.7
12	40.4	22.1	45.1	26.8
13	37.7	20.6	42.1	25.0
14	35.2	19.2	39.3	23.3
15	32.9	17.9	36.7	21.7
16	30.7	16.7	34.3	20.3
17	28.7	15.6	32.0	18.9
18	26.8	14.6	29.9	17.6
19	25.0	13.6	27.9	16.4
20	23.3	12.7	26.0	15.3
21	21.7	11.9	24.3	14.3
22	20.3	11.1	22.7	13.3
23	18.9	10.4	21.2	12.4
24	17.6	9.7	19.8	11.6
≥ 25	20.0	5.0	25.0	10.0

2.8.5. Norms for Recharge due to Tanks & Ponds

As the data on the field studies for computing recharge from Tanks & Ponds are very limited, it is recommended to follow the same norm as followed in GEC 1997 in future assessments also. Hence the norm recommended by GEC-2015 for Seepage from Tanks & Ponds is 1.4 mm / day.

2.8.6. Norms for Recharge due to Water Conservation Structures

Even though the data on the field studies for computing recharge from Water Conservation Structures are very limited, it is recommended that the Recharge from the water conservation structures is 40% of the Gross Storage based on the field studies by Non-Government Organizations. Hence, the norm recommended by GEC-2015 for the seepage from Water Conservation Structures is 40% of gross storage during a year which means 20% during monsoon season and 20% during non-monsoon Season.

2.8.7. Norm for Per Capita Requirement

As the option is given to use the actual requirement for domestic needs, the Requirement Norm recommended by the committee is 60 lpcd for domestic needs. This can be modified if the actual requirement is known.

2.8.8. Norm for Natural Discharges

The Discharge Norm used in computing Unaccounted Natural Discharge is 5% if water table fluctuation method is used or 10% if rainfall infiltration factor method is used for assessing the Rainfall recharge. This committee recommends to compute the base flow for each assessment unit. Wherever, there is no assessment of base flow, earlier norms recommended by GEC 1997 i.e. 5% or 10% of the Total Annual Ground Water Recharge as the Natural Discharges may be continued.

2.8.9. Unit Draft

GEC-1997 methodology recommends to use well census method for computing the ground water draft. The norm used for computing ground water draft is the unit draft. The unit draft can be computed by field studies. This method involves selecting representative abstraction structure and calculating the discharge from that particular type of structure and collecting the information on how many hours of pumping is being done in various seasons and number of such days during each season. The Unit Draft during a particular season can be computed using the following equation:

$$\boldsymbol{Unit\ Draft = Discharge\ in\ m^3/hr \times No.\ of\ pumping\ hours\ in\ a\ day \times No.\ of\ days} \dots\dots\dots(\mathbf{29})$$

One basic drawback in the methodology of computing unit draft is that there is no normalization procedure for the same. As per GEC-1997 guidelines, the recharge from rainfall is normalized for a normal rainfall. It means that even though the resources are estimated in a surplus rainfall year or in a deficit rainfall year, the assessment is normalised for a normal rainfall which is required for planning. For recharge from other sources, average figures/ values are taken. If the average figures are not available for any reason, 60% of the design figures are taken. This procedure is very much essential as the planning should be for average resources rather than for the recharge due to excess rainfall or deficit rainfall. But the procedure that is being followed for computing unit draft does not have any normalization procedure. Normally, if the year in which one collects the draft data in the field is an excess rainfall year, the abstraction from ground water will be less. Similarly, if the year of the computation of unit draft is a drought year the unit draft will be high. Hence, there is a requirement to devise a methodology that can be used for the normalization of unit draft figures. The following are the two simple techniques, which can be followed. If the unit draft values for one rainfall cycle are available for at least 10 years second method shown in equation 31 is to be followed or else the first method shown in equation 30 may be used.

$$\boldsymbol{Normalised\ Unit\ Draft = \frac{Unit\ Draft \times Rainfall\ for\ the\ year}{Normal\ Rainfall}} \dots\dots\dots\dots\dots\dots.\dots\dots\dots(\mathbf{30})$$

$$\boldsymbol{Normalised\ Unit\ Draft = \frac{\sum_{i=1}^{n} Unit\ Draft_i}{Number\ of\ Years}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(\mathbf{31})$$

Although GEC-1997 methodology recommends a default value for the unit drafts, each State is using its own values, generally after conducting field studies, even though without a documentation. Hence, it is felt that this norm may be computed by the state agency, which is going to assess the norms before commencement of the assessment. But it is strongly recommended that the field studies should be documented and submitted along with the results of the assessment.

2.9. INDIA -GROUNDWATER RESOURCE ESTIMATION SYSTEM (IN-GRES)

"INDIA-GROUNDWATER RESOURCE ESTIMATION SYSTEM (IN-GRES) is a Software/Web-based Application developed by CGWB in collaboration with IIT-Hyderabad. It providescommon and standardized platform for Ground Water Resource Estimation for the entire country and its pan-India operationalization (Central and State Governments). The system take'Data Input' through Excel as well as Forms, compute various ground water components (recharge, extraction etc.) and classify assessment units into appropriate categories (safe, semi-critical, critical and over-exploited). The Software uses GEC 2015 Methodology for estimation and calculation of Groundwater resources. It allows for unique and homogeneous representation of groundwater fluxes as well as categories for all the assessment units (AU) of the country.

URL of IN-GRES →http://ingres.iith.ac.in

The detailed description about IN-GRES Software is given in **Appendix-C**.

CHAPTER 3

3.0 RAINFALL OF INDIA

Rainfall is the main source of ground water recharge in the country. However, distribution of rainfall has a wide variation both in space and time. Rain gauge stations are established and maintained by different departments and Undertakings of Central and State governments and also by private parties as per their specific data requirements. Though the period of seasons varies from place to place, for climatological purposes especially for rainfall, a year is divided into 4 seasons: Winter (January and February), Pre monsoon (March to May), South West Monsoon (June to September) and Post Monsoon (October to December). Most part of India receives rainfall mainly during SW Monsoon season.

Rainfall is highly variable in time and space. Over 75% of the annual rainfall is received in the four rainy months from June to September only there by leading to large variations on temporal scale. The average annual rainfall is 119 cm, but it has great spatial variations. The areas on the Western Ghats and the Sub-Himalayan areas in North East and Meghalaya Hills receive heavy rainfall of over 250 cm annually, whereas the Areas of Northern parts of Kashmir and Western Rajasthan receive rainfall less than 40 cm. Rainfall Normal have been computed using rainfall records of 50 years (1961-2010) of a network of 3200 Stations all over the India. The two significant features of India's Monsoon rainfall are that, in the north India, rainfall decreases westwards and in the Peninsular India, it decreases eastwards and then increases in the coastal region.

In 2021, the actual annual rainfall received by the country was 1236.4 mm which was 105% of its long period average (LPA). The country received actual SW Monsoon season (June to September) rainfall of 874.5 mm which was 99% of its long period average (LPA). The rainfall for the country as whole during Pre-monsoon, Post Monsoon and winter season was 155.6mm, 177.9 mm & 27.8 mm which was 118%, 144% & 68% of LPA respectively. The rainfall deficiency for the country as a whole was maximum (32%) during Winter season. Annually, Met sub-division-wise, Konkan & Goa received highest rainfall of 3558.7 mm and West Rajasthan received lowest rainfall of 317.5 mm. [*Source: Rainfall Statistics of India-2021 of India Meteorological Department (Ministry of Earth Sciences), Report No.-MoES/IMD/HS/Rainfall Report/02(2022)/60*]

State wise seasonal and annual observed rainfalls for the states are given in ***Table-3.1***. It has been observed that during 2021, annual highest area weighted rainfall of **4032.5** mm was received at Konkan & Goa and the lowest rainfall of **317.5** mm was received at West Rajasthan. During the SW Monsoon season, Konkan & Goa received highest rainfall of **3558.7** mm and West Rajasthan received lowest rainfall of **317.5** mm.

State wise monthly observed rainfall (mm) for the states is given in ***Table-3.2***. During SW Monsoon season, monthly highest rainfall of **1272.9** mm occurred over the state of Goa in the month of July and minimum rainfall of **0.9** mm occurred over the Ladakh (UT) in the month of August.

Table-3.1 : State –wise Seasonal Rainfall (mm) -Year 2021

S.NO.	Broad Region/ States	Winter	Pre-Monsoon	SW-Monsoon	Post-Monsoon	Annual
EAST & NORTHEAST INDIA						
1	ARUNACHALPRADESH	41.8	581.5	1294.0	157.2	2083.8
2	ASSAM	41.8	581.5	1294.0	157.2	2083.8
3	MEGHALAYA	1.2	699.6	2257.6	213.6	3171.9
4	NAGALAND	7.4	211.1	841.1	93.5	1153.1
5	MANIPUR	10.1	225.7	560.9	116.9	913.6
6	MIZORAM	2.9	185.0	1271.3	193.9	1653.1
7	TRIPURA	7.5	274.1	1246.1	233.3	1761.1
8	SIKKIM	68.9	828.8	1798.0	347.7	3043.3
9	WESTBENGAL	2.0	300.9	1612.9	286.9	2202.7
10	JHARKHAND	3.6	240.5	1041.5	159.3	1444.8
11	BIHAR	0.7	266.0	1044.3	201.7	1512.7
NORTHWEST INDIA						
1	UTTARPRADESH	7.5	95.7	749.2	93.7	946.1
2	UTTARAKHAND	44.5	244.2	1156.1	219.6	1664.5
3	HARYANA	26.1	54.5	571.3	27.9	679.8
4	CHANDIGARH(UT)	19.6	80.9	600.2	41.6	742.4
5	DELHI	31.0	76.4	745.2	60.7	904.4
6	PUNJAB	13.0	49.7	436.8	34.8	534.4
7	HIMACHALPRADESH	57.7	213.7	690.9	75.4	1037.6
8	JAMMU&KASHMIR(UT)	122.6	248.0	401.6	122.6	894.7
9	LADAKH(UT)	8.5	20.2	21.9	6.3	57.0
10	RAJASTHAN	9.0	54.4	485.3	38.3	587.0
CENTRAL INDIA						
1	ODISHA	4.2	188.6	1045.1	182.9	1420.8
2	MADHYAPRADESH	9.2	68.7	942.7	72.2	1092.7
3	GUJARAT	1.2	49.8	694.6	47.6	793.2
4	DADRA& NAGARHAVELI (UT)	0.0	139.2	2674.2	221.0	3034.4
5	DAMAN &DIU(UT)	0.0	218.3	1869.0	125.5	2212.8
6	GOA	37.3	284.8	3125.1	500.0	3947.2
7	MAHARASHTRA	12.8	62.8	1194.3	140.8	1410.7
8	CHHATISGARH	12.8	97.3	1107.7	91.9	1309.6
SOUTH PENINSULA						
1	A&NISLAND(UT)	91.5	602.6	2025.0	774.4	3493.4
2	ANDHRAPRADESH	24.4	104.5	613.5	406.4	1148.9
3	TELANGANA	3.5	66.7	1044.2	94.2	1208.5
4	TAMILNADU	150.8	120.9	393.4	711.6	1376.7
5	PUDUCHERRY(UT)	350.3	64.3	435.8	1425.1	2275.5

Table-3.1 : State –wise Seasonal Rainfall (mm) -Year 2021						
S.NO.	**Broad Region/ States**	**Winter**	**Pre-Monsoon**	**SW-Monsoon**	**Post-Monsoon**	**Annual**
6	KARNATAKA	36.3	179.2	865.4	369.9	1450.9
7	KERALA	114.1	746.8	1719.1	1026.3	3606.3
8	LAKSHADWEEP(UT)	216.9	514.6	790.9	376.3	1898.7
COUNTRYASAWHOLE		**27.8**	**155.6**	**874.5**	**177.9**	**1236.4**

Table-3.2: State -wise Monthly Rainfall (mm) -Year 2021													
S. No	**STATES**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
EAST & NORTH EAST INDIA													
1	ARUNACHAL PRADESH	29.1	12.7	98.4	183.7	296.5	377.3	266.8	508.7	141.2	124.6	13.9	16.8
2	ASSAM	11.1	2.8	40.7	76.6	220.7	379.8	305.6	296.1	168.5	120.2	3.9	10.9
3	MEGHALAYA	0.5	0.7	53.4	190.1	456.0	721.3	496.8	865.9	173.6	203.4	0.0	10.3
4	NAGALAND	5.5	1.8	37.9	36.5	136.7	230.7	231.5	239.4	139.5	74.6	2.1	16.8
5	MANIPUR	8.5	1.6	37.6	57.0	131.1	174.2	132.8	170.0	83.9	74.2	4.2	38.5
6	MIZORAM	2.9	0.0	26.6	37.5	120.8	284.5	348.6	337.9	300.3	105.7	22.4	65.8
7	TRIPURA	7.5	0.0	51.5	31.3	191.2	283.4	393.7	335.0	234.0	104.6	12.2	116.5
8	SIKKIM	22.4	46.5	182.2	237.1	409.5	489.5	515.0	519.3	274.1	301.6	16.5	29.6
9	WEST BENGAL	1.0	1.0	7.8	31.6	261.5	394.3	435.8	358.6	424.2	214.2	20.5	52.2
10	JHARKHAND	1.0	2.6	9.3	7.3	223.9	266.8	319.5	200.0	255.2	111.7	24.0	23.5
11	BIHAR	0.2	0.5	1.4	5.0	259.6	354.3	258.3	328.7	103.0	189.6	0.0	12.0
NORTH WEST INDIA													
1	UTTAR PRADESH	5.5	2.0	0.5	2.5	92.7	151.5	212.8	214.2	170.7	89.3	0.1	4.3
2	UTTARAKHAND	27.3	17.2	11.0	57.7	175.5	262.9	371.6	307.6	214.0	203.2	1.0	15.4
3	HARYANA	21.1	5.0	4.3	4.5	45.7	48.8	253.1	81.9	187.5	25.1	0.0	2.8
4	CHANDIGARH (UT)	6.3	13.3	6.2	13.9	60.8	119.4	148.1	160.2	172.5	41.0	0.2	0.5
5	DELHI	29.6	1.4	1.2	2.6	72.6	29.6	338.9	144.7	232.1	56.7	0.0	4.0
6	PUNJAB	10.4	2.6	6.9	18.9	23.9	49.7	173.7	70.3	143.2	34.6	0.1	0.1
7	HIMACHALPRADESH	38.4	19.3	41.7	111.8	60.1	84.6	289.0	146.0	171.3	56.7	1.1	17.6
8	JAMMU & KASHMIR(UT)	87.3	35.3	103.9	83.2	61.0	38.2	212.3	74.1	76.9	101.0	4.9	16.6
9	LADAKH(UT)	4.1	4.4	7.2	9.0	4.0	1.4	11.4	0.9	8.2	4.2	0.1	2.1
10	RAJASTHAN	5.5	2.0	0.5	2.5	92.7	151.5	212.8	214.2	170.7	89.3	0.1	4.3
CENTRAL INDIA													
1	ODISHA	1.3	2.9	5.1	26.0	157.5	181.3	275.0	204.9	384.0	80.4	53.7	48.8
2	MADHYAPRADESH	3.3	5.9	7.7	1.3	59.6	166.4	280.2	264.4	231.7	55.6	5.3	11.3
3	GUJARAT	1.1	0.1	0.0	1.2	48.6	98.9	148.2	47.0	400.5	24.2	13.0	10.4
4	DADRA & NAGARHAVELI (UT)	0.0	0.0	0.0	0.0	139.2	430.0	713.5	365.0	1165.7	114.2	22.8	84.0
5	DAMAN & DIU (UT)	0.0	0.0	0.0	0.0	218.3	204.1	490.1	493.8	681.1	19.2	31.3	75.0
6	GOA	26.1	11.3	0.9	27.8	256.1	946.9	1272.9	346.2	559.1	223.3	182.6	94.0
7	MAHARASHTRA	6.9	5.9	6.6	9.7	46.5	267.5	397.2	179.3	350.2	82.7	25.5	32.7
8	CHHATISGARH	2.3	10.5	4.0	18.1	75.2	244.4	331.7	221.5	310.2	39.5	23.0	29.4
SOUTH PENINSULA													
1	A & N ISLAND (UT)	42.7	48.8	38.3	150.2	414.1	315.9	535.3	506.5	667.3	413.1	265.7	95.5
2	ANDHRAPRADESH	15.8	8.6	0.4	28.6	75.5	95.6	202.5	138.5	177	118.8	269.1	18.5
3	TELANGANA	1.7	1.7	0.4	23.4	42.9	195.7	365.7	192.8	290.1	59.1	33.6	1.5
4	TAMILNADU	139.1	11.7	7.4	36.9	76.6	62.4	124.7	88.7	117.6	228.1	423.1	60.4
5	PUDUCHERRY (UT)	197.1	153.2	0.4	4.1	59.8	44.5	104.5	147.3	139.5	380.5	986.3	58.3

Table-3.2: State -wise Monthly Rainfall (mm) -Year 2021													
S. No	**STATES**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
6	KARNATAKA	22.4	13.9	3	49.4	126.8	224	311.9	168.6	160.9	194.2	155.2	20.5
7	KERALA	105.5	8.6	49.7	127.6	569.4	408.3	577.4	416.2	317.1	589.5	394.5	42.3
8	LAKSHADWEEP (UT)	167.5	49.3	9.3	95.8	409.5	160	156.5	319.5	154.9	160.1	165.1	51.1

3.1 METEROLOGICAL SUBDIVISION-WISE ANNUAL & SEASONAL RAINFALL MAPS

The rainfall statistics is computed based on the receipt of rainfall data from about 5100 stations spread over the entire country out which 264 stations and 05 districts were added during 2021. Based on daily rainfall data of these stations, the rainfall of all the districts is computed and using the rainfall of the districts, rainfall statistics for the Meteorological (Met.) Subdivisions, states, the four broad regions and for the whole country have been computed. The present publication includes the updated rainfall statistics for the country as a whole, for the four broad regions, 36 Meteorological Subdivisions, States, UTs and 695 Districts of India. The statistics is provided on monthly, seasonal i.e. winter (January-February), Pre-Monsoon (March-May), Southwest (SW) Monsoon (June-September) and Post-Monsoon (October-December), and on Annual basis. The Rainfall Normal used in this report are based on the rainfall records for the period from 1961-2010. Percentage departure of rainfall from Rainfall Normal's has been color coded as per their categories. The list of categories, their corresponding ranges and color codes is given in ***Table-3.3***.

Met. Subdivision-wise rainfall maps for the year 2021 and for the four seasons depicting the observed and normal rainfall values along with their percentage departure from normal with defined colours for different categories are given below at ***Fig-3.1 to Fig-3.5***. The normal rainfall values are shown in Bold figures on the map whereas the actual rainfall is shown in small figures. Percentage departures of rainfall are shown within the brackets.

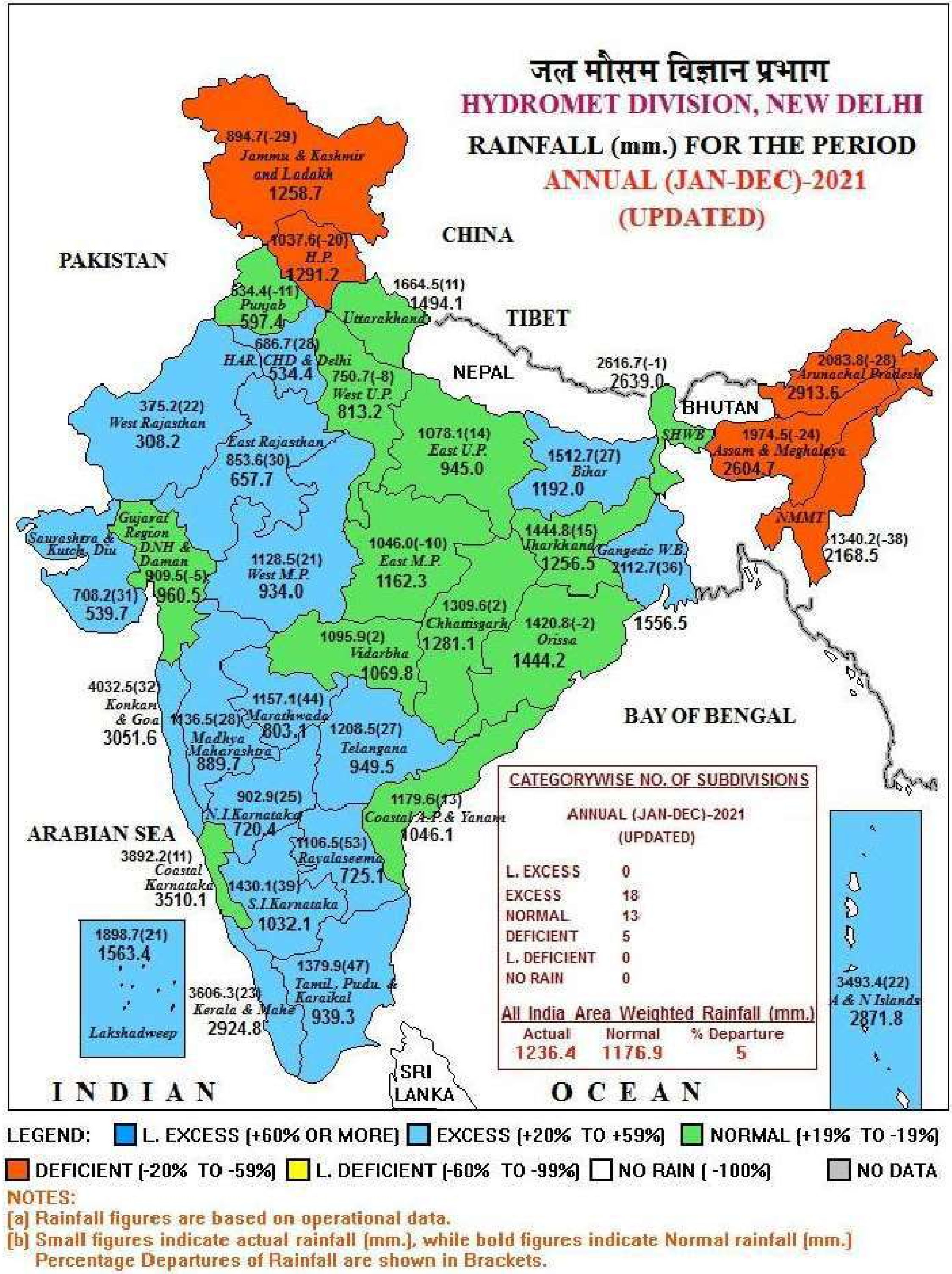
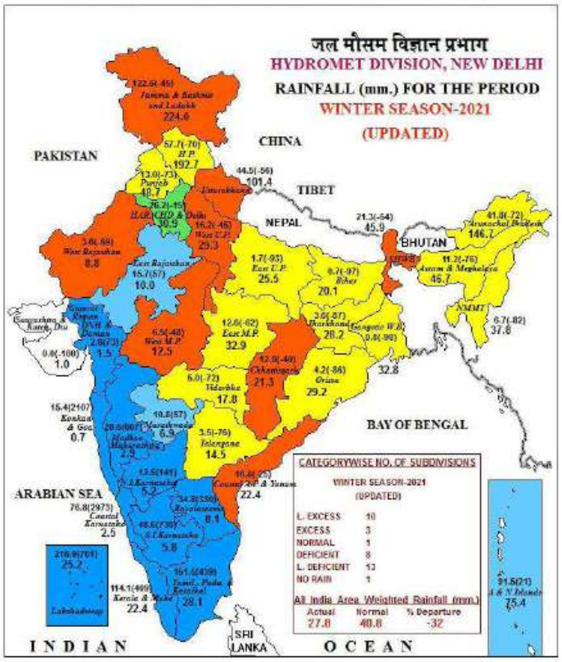


Figure-3.1: Annual Rainfall Map-2021



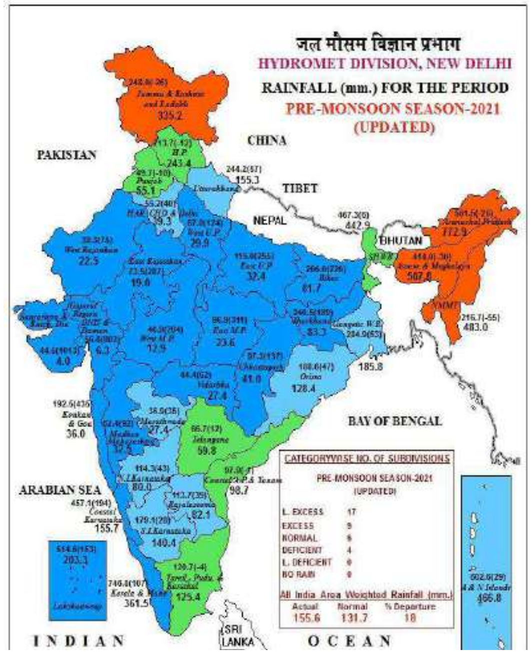
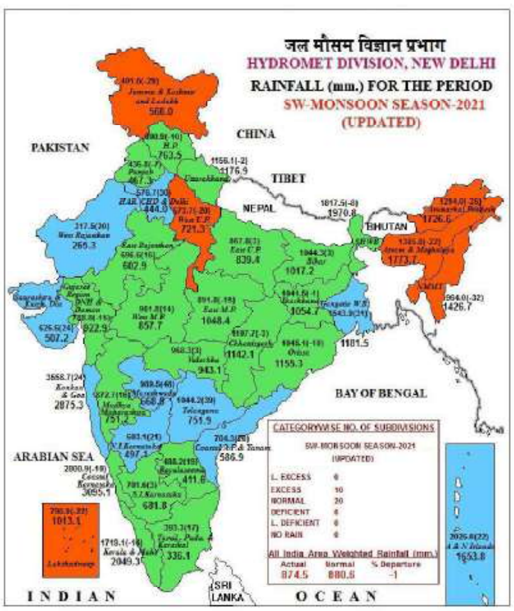


Figure-3.2 : Winter Rainfall Map	Figure-3.3 :Pre-Monsoon Rainfall Map



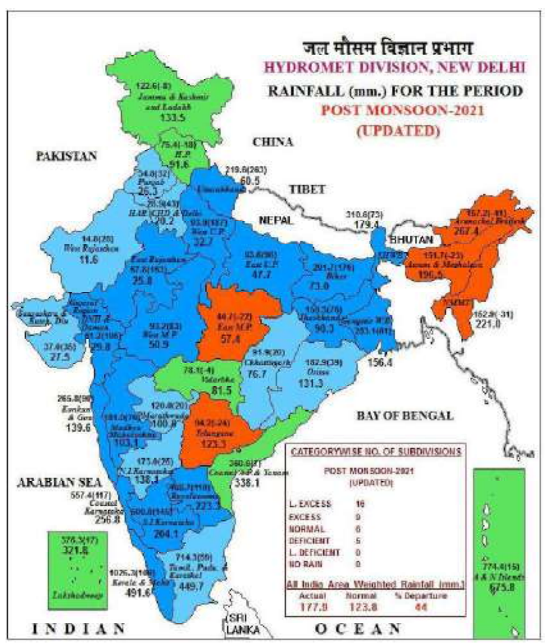


Figure-3.4 : SW Monsoon Rainfall Map	Figure-3.5 : Post-Monsoon Rainfall Map

Large Excess [60% or more] | Excess [20% to 59%] | Normal [-19% to 19%] | Deficient [-59% to -20%] | Large Deficient [-99% to -60%] | No Rain [-100%] | No Data

NOTES :

a) RainFall figures are based on operation data.

b) Small figures indicate actual rainfal (mm), while bold figures indicate Normal rainfall (mm).

c) Percentage Departures of rainfall are shown in brackets.

Table-3: The list of categories, their corresponding ranges and color codes

Category	Departure fromNormal	Color Code
Large Excess(LE)	60% ormore	
Excess (E)	20%to 59%	
Normal(N)	-19%to+19%	
Deficient(D)	-20%to-59%	
LargeDeficient(LD)	-60%to-99%	
NoRain	-100%	
NoData	DataNotAvailable	

CHAPTER 4

4.0 HYDROGEOLOGICAL SETUP OF INDIA

India is occupied by a variety of hard and fissured formations, including crystalline, trappean basalt and consolidated sedimentaries (including carbonate rocks), with patches of semi- consolidated sediments in narrow intra-cratonic basins. Apart from this, the northern part of the country and south of Himalayan terrain is occupied by alluvial formation stretching from Rajasthan in the west to Brahmaputra valley in the east. Rugged topography, compact and fissured nature of the rock formations combine to give rise to discontinuous aquifers, with moderate to poor yield potentials. The near surface weathered mantle coupled with deeper fractures form an important aquifer in case of hard rocks. In hard rock terrains, deep weathered pediments, lowlands, valley fills and abandoned river channels, generally have adequate thickness of porous material, to act as repositories of groundwater.

4.1 AQUIFER SYSTEMS OF INDIA

Various rock formations with different hydrogeological characteristics act as distinct aquifer systems of varying dimensions. The aquifer systems of India can be broadly categorized in to 14 Principal Groups. A brief description of the Principal Aquifer Systems (***Fig- 4.1***), as identified by CGWB (CGWB 2012) is given below.

4.1.1 Alluvial Aquifers

The Quaternary sediments comprising Recent Alluvium, Older Alluvium, Aeolian Alluvium (Silt/ Sand) and Coastal Alluvium of Bay of Bengal are by and large important unconsolidated formations constituting major alluvial aquifers. These sediments are essentially composed of clays, silts, sands, pebbles, Kankar etc. These are by far the most significant ground water reservoirs for large scale and extensive development. The hydrogeological environment and ground water regime in the Indo-Ganga-Brahmaputra basin indicate the existence of potential aquifers having enormous fresh ground water reserves. Bestowed with high incidence of rainfall and covered by a thick pile of porous sediments, these ground water reservoirs get replenished every year and are being used heavily. In these areas, in addition to the Annual Replenishable Ground Water Resources available in the zone of Water Level Fluctuation (Dynamic Ground Water Resource), there exists a huge ground water reserve in the deeper part below the zone of fluctuation as well as in the deeper confined aquifers. The coastal aquifers show wide variation in water quality, both laterally and vertically, thus imposing quality constraints for groundwater development.

4.1.2 Laterite

Laterites are formed from the leaching (chemical weathering) of parent sedimentary rocks (sandstones, clays, limestones); metamorphic rocks (schists, gneisses, migmatites) and igneous rocks (granites, basalts, gabbros, peridotites). It is rich in iron and aluminium, formed in hot and wet tropical areas. Laterites are the most wide spread and extensively developed aquifer especially in the peninsular states of India. Laterite forms potential aquifers along valleys and topographic lows where the thickness of the saturated zone is more and can sustain large diameter open wells for domestic and irrigation use.

4.1.3 Sandstone, Shale Aquifers

The sandstone and shale aquifers generally belong to the group of rocks ranging in age from Carboniferous to Mio-Pliocene. The terrestrial freshwater deposits belonging to Gondwana System and the Tertiary deposits along the west and east coast of the peninsular region are included under this category. The Gondwana sandstones form highly potential aquifers, locally. Elsewhere, they have moderate potential and in places they yield meager supplies. The Gondwanas, Lathis, Tipams, Cuddalore sandstones and their equivalents are the most extensive productive aquifers in this category.

4.1.4 Limestone Aquifers

The consolidated sedimentary rocks include carbonate rocks such as limestones, dolomite and marble. Among the carbonate rocks, limestones occupy the largest area. In the carbonate rocks, the principal water bearing zones are the fractures and solution cavities. Consolidated sedimentary rocks of Cuddapah and Vindhyan subgroups and their equivalents consist of limestones/dolomites apart from other major litho-units such as conglomerates, sandstones, shales, slates and quartzites.

4.1.5 Basalt Aquifers

Basalt is a basic volcanic rock which forms alternate layers of compact and vesicular beds of lava flows as seen in the Deccan trap area. The ground water occurrence in basalts are controlled by nature and extent of weathering, presence of vesicles and lava tubes, thickness of flows, number of flows and the nature of inter-trappean layers. Basaltic aquifers have usually medium to low permeability. Ground water occurrence in the Deccan Traps is controlled by the contrasting water bearing properties of different flow units, thus, resulting in multiple aquifer system, at places. The water bearing zones are the weathered and fractured zones.

4.1.6 Crystalline Aquifers

The crystalline hard rock aquifers such as granite, gneisses and high grade metamorphic rocks such as charnockites and khondalites constitute good repository of ground water. Most of the results of groundwater exploration projects have proven that hard rocks neither receive nor transmit water, unless they are weathered and/or fractured. The aquifers are the weathered zone or the fracture system. The fracture system includes fractures, joints, bedding planes, and solution holes. These openings do not have an even distribution and are rather localized. The weathered zone is underlain by semi-weathered rock, fractured rock followed by bedrock. The depth of the bed rock varies from 30-100 m.

In hard rock terrains, ground water occurs under phreatic condition in the mantle of weathered rock, overlying the hard rock, while within the fissures, fractures, cracks, joints within the hard rock, ground water is mostly under semi-confined or in the confined state. Compared to the volume of water stored under semi-confined condition within the body of the hardrock, the storage in the overlying phreatic aquifer is often much greater. In such cases, the network of fissures and fractures serves as a permeable conduit feeding this water to the well. Ground water flow rarely occurs across the topographical water divides and each basin or sub-basin can be treated as a separate hydrogeological unit for planning the development of ground water resources.

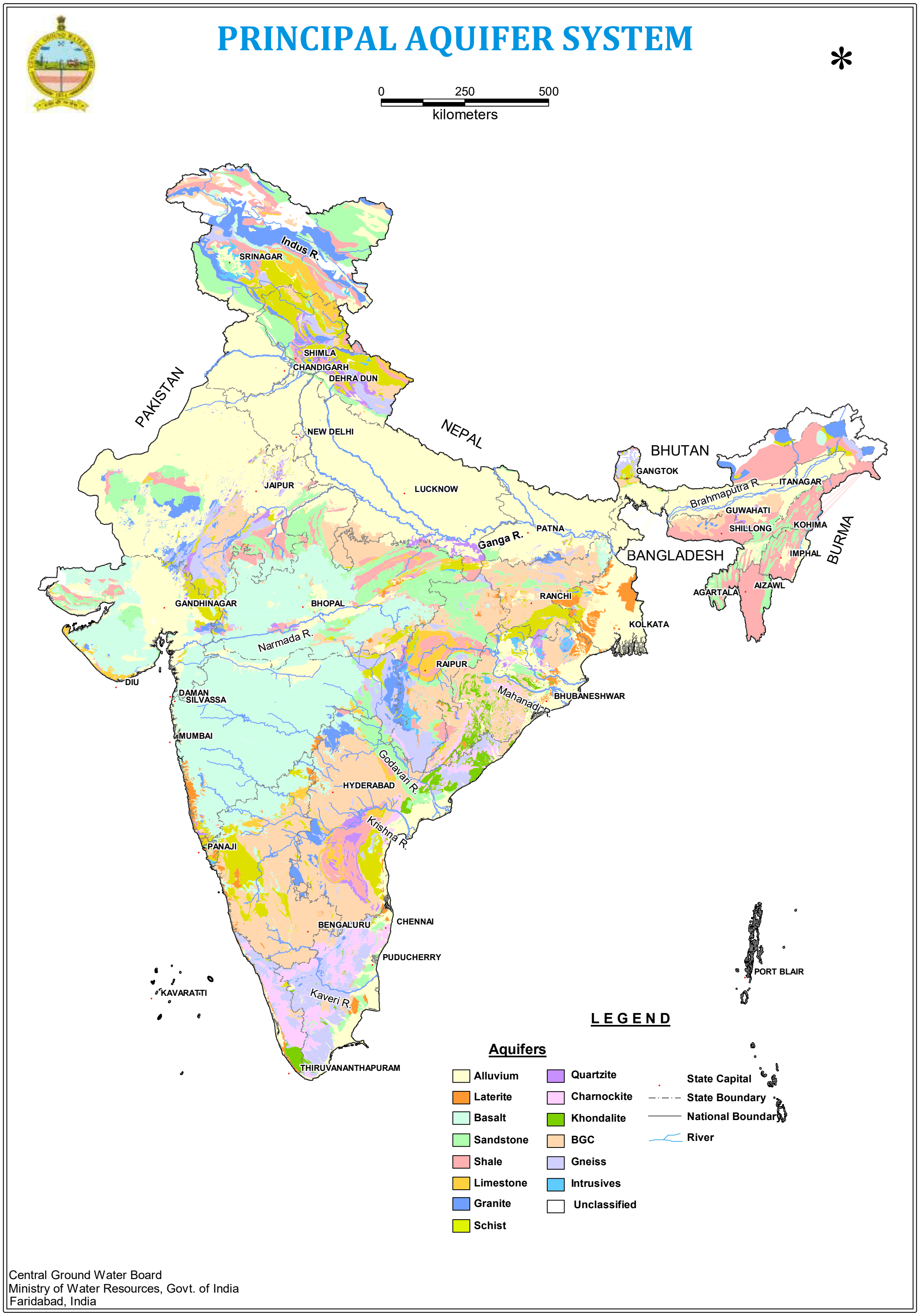


Fig-4.1: Principal Aquifer Systems of India

CHAPTER-5

5.0 GROUND WATER LEVEL SCENARIO IN THE COUNTRY

Groundwater level is one of the basic data elements, which reflects the groundwater regime in an area. Central Ground Water Board (CGWB) monitors groundwater levels four times a year during January, April/ May, August and November through a network of fixed observation wells spreading throughout the country. The periodicity of groundwater level monitoring by the State Governments varies from State to State. The primary objective of monitoring the groundwater level is to record the response of groundwater 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. Water level data generated and archived by CGWB along with data from State Government departments have been used for assessment of groundwater resources. An outline of groundwater scenario during the period of assessment is given below.

5.1 GROUNDWATER LEVEL SCENARIO (2022)

Groundwater level data of **pre-monsoon 2022** for the country (**Fig. 5.1**) reveals that the general depth to water level of the country ranges from 5 to 10 m bgl. Very shallow water levels of less than 2 m bgl is observed in few states, such as Assam, Andhra Pradesh, Bihar, Karnataka, Kerala, Jharkhand, Maharashtra, Meghalaya and Tamil Nadu in small patches. Groundwater level in the range of 2 to 5 m bgl is seen in Assam, Andhra Pradesh, northern parts of Uttar Pradesh and Bihar, Coastal parts of Odisha, few pockets in Telangana, Karnataka, Kerala, Tamil Nadu, Gujarat and Maharashtra. Major part of the country shows water level in the range 5 to 10 m bgl, especially in the states of Madhya Pradesh, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Odisha, Chhattisgarh, Maharashtra, Gujarat, Tamil Nadu, Telangana and Karnataka. In major parts of north-western and western states, especially in the states of Delhi, Haryana, Punjab and Rajasthan, depth to water level is generally deeper and ranges from about 20 to more than 40 m bgl. The peninsular part of the country recorded water level in the range of 5 to 20 m bgl.

The groundwater level data for **post-monsoon 2022** indicates that out of the total 14577 wells analysed, 3697 (25.4%) wells are showing water level less than 2 m bgl (metres below ground level), 6095 (41.8%) wells are showing water level in the depth range of 2 to 5 m bgl, 3127 (21.5%) wells are showing water level in the depth range of 5 to 10 m bgl, 1039 (7.1%) wells are showing water level in the depth range of 10 to 20 m bgl, 414 (2.8%) wells are showing water level in the depth range of 20 to 40 m bgl and the remaining 205 (1.4%) wells are showing water level more than 40 m bgl. The general depth to water level of the country ranges from 0 to 5 m bgl as almost 70% of the wells fall in this range. Very shallow water level of less than 2 m bgl is observed in all the states, except Chandigarh. Groundwater level in the range of 2 to 5 m bgl is also predominant in the entire country. Deeper water level is observed in parts of north-western and western states, especially in the states/UTs of Chandigarh, Delhi, Haryana, Punjab and Rajasthan, depth to water level is generally deeper and ranges from about 10 m bgl to more than 40 m bgl. The depth to water level map of the country is shown in **Fig. 5.2**.

5.1.1 Fluctuation of Groundwater level: Pre-monsoon 2022 compared to Pre-monsoon 2021

A comparison of depth to water level of Pre-monsoon 2022 with Pre-monsoon 2021 (**Fig. 5.3**) indicates that 45.8% of the total 8050 Nos analysed wells show rises in water level whereas almost 52.8% wells show decline in water level. 1.0% wells show no change. Rise and decline in water level are primarily in the 0 to 2 m range. Decline of water level is quite prominent in the states Gujarat, Rajasthan, Madhya Pradesh, Punjab, Bihar, Uttar Pradesh and West Bengal. Decline of more than 4 m water level is observed in small pockets in the states of Chhattisgarh, Gujarat, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh and West Bengal. Due to COVID-19 pandemic monitoring data in November 2021 is insufficient.

5.1.2 Fluctuation of Groundwater level: November 2022 compared to November 2021

A comparison of depth to water level of November 2021 with November 2021 (**Fig. 5.4**) indicates that 42.7% of the total 13074 Nos analysed wells show rises in water level whereas 55.8% wells show decline in water level. 1.4% wells show no change. Rise and decline in water level are primarily in the 0 to 2 m range. Rise in water level is prominently seen in the states/UTs of Andaman & Nicobar, Andhra Pradesh, Chandigarh, Chhattisgarh, Delhi, Gujarat, Daman & Diu, Haryana, Karnataka, Madhya Pradesh, Odisha, Puducherry, Rajasthan, Tamil Nadu, Telangana, Uttaranchal, Uttar Pradesh and West Bengal. Similarly states where decline in water level is observed in significant parts are Assam, Chhattisgarh, Dadra & Nagar Haveli, Goa, Gujarat, Jharkhand, Maharashtra, Odisha, Punjab, Rajasthan and West Bengal. Water levels deeper than 4 m are observed in small packets in Chandigarh, Gujarat, Rajasthan, Uttar Pradesh, Bihar, and West Bengal.

5.1.3 Fluctuation of Groundwater level: decadal water level fluctuation with mean Pre-Monsoon (2012 to 2021) and Pre-Monsoon 2022

A comparison of decadal water level fluctuation with mean of pre-monsoon (2012 to 2021) and pre-monsoon 2022 (**Fig. 5.5**) indicates that 66.6% of the analysed wells show rise in water level whereas 33.3% wells show decline in water level. 0.1% wells show no change. Rise and decline in water level are primarily in the 0 to 2 m range. Rise in water level is prominently seen in the states/UTs of Andaman & Nicobar, Andhra Pradesh, Asam, Bihar, Gujarat, Daman & Diu, Jharkhand, Karnataka, Kerala, Maharashtra, Odisha, Puducherry, Rajasthan, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh and West Bengal. Similarly states where decline in water level is observed in significant parts are Chandigarh, Chhattisgarh, Goa, Gujarat, Jharkhand, Maharashtra, Odisha, Punjab, Rajasthan, Uttar Pradesh and West Bengal. Water levels deeper than 4 m are observed in small packets in Chandigarh, Chhattisgarh, Gujarat, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, and West Bengal.

5.1.4 Fluctuation of Groundwater level: decadal water level fluctuation with mean Post-Monsoon (2012 to 2021) and Post-Monsoon 2022

A comparison of decadal water level fluctuation with mean of post-monsoon (2012 to 2021) and post-monsoon 2022 (**Fig. 5.6**) indicates that 61.1% of the analysed wells show rise in water level whereas 38.9% wells show decline in water level. Rise and decline in water level are primarily in the 0 to 2 m range. Rise in water level is prominently seen in the states/UTs of Andaman & Nicobar, Andhra Pradesh, Asam, Gujarat, Daman & Diu, Haryana, Jharkhand, Karnataka, Maharashtra, Odisha, Puducherry, Rajasthan, Tamil Nadu, Telangana, Uttarakhand, and Uttar Pradesh. Similarly states where decline in water level is observed in significant parts are Assam, Bihar, Chandigarh, Chhattisgarh, Goa, Gujarat, Jharkhand, Kerala, Maharashtra, Odisha, Punjab, Rajasthan, Uttar Pradesh and West Bengal. Water levels deeper than 4 m are observed in small packets in Chandigarh, Gujarat, Punjab, Rajasthan, Uttar Pradesh, and West Bengal.

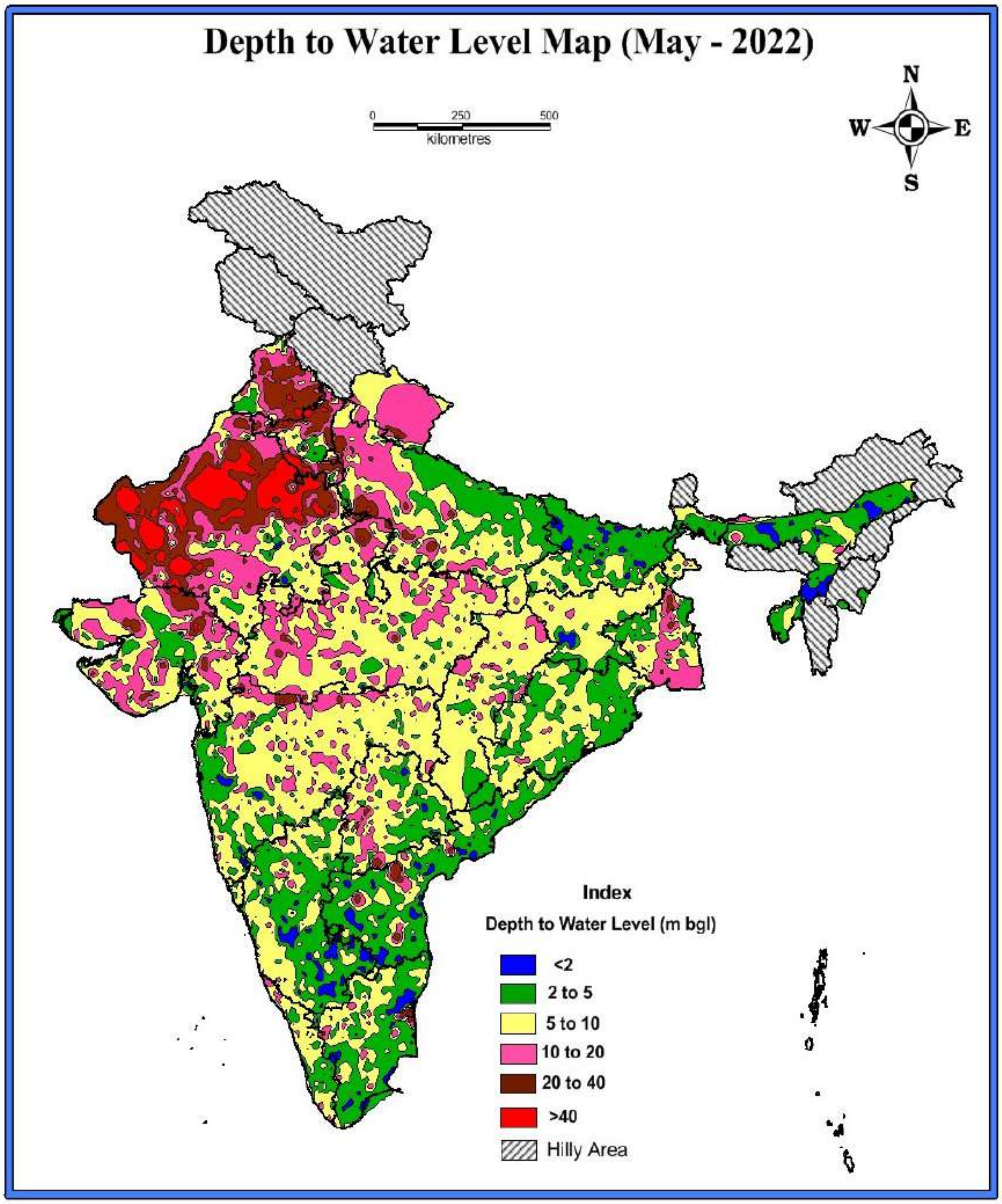


Fig-5.1: Pre-monsoon Depth to Water Level Map (2022)

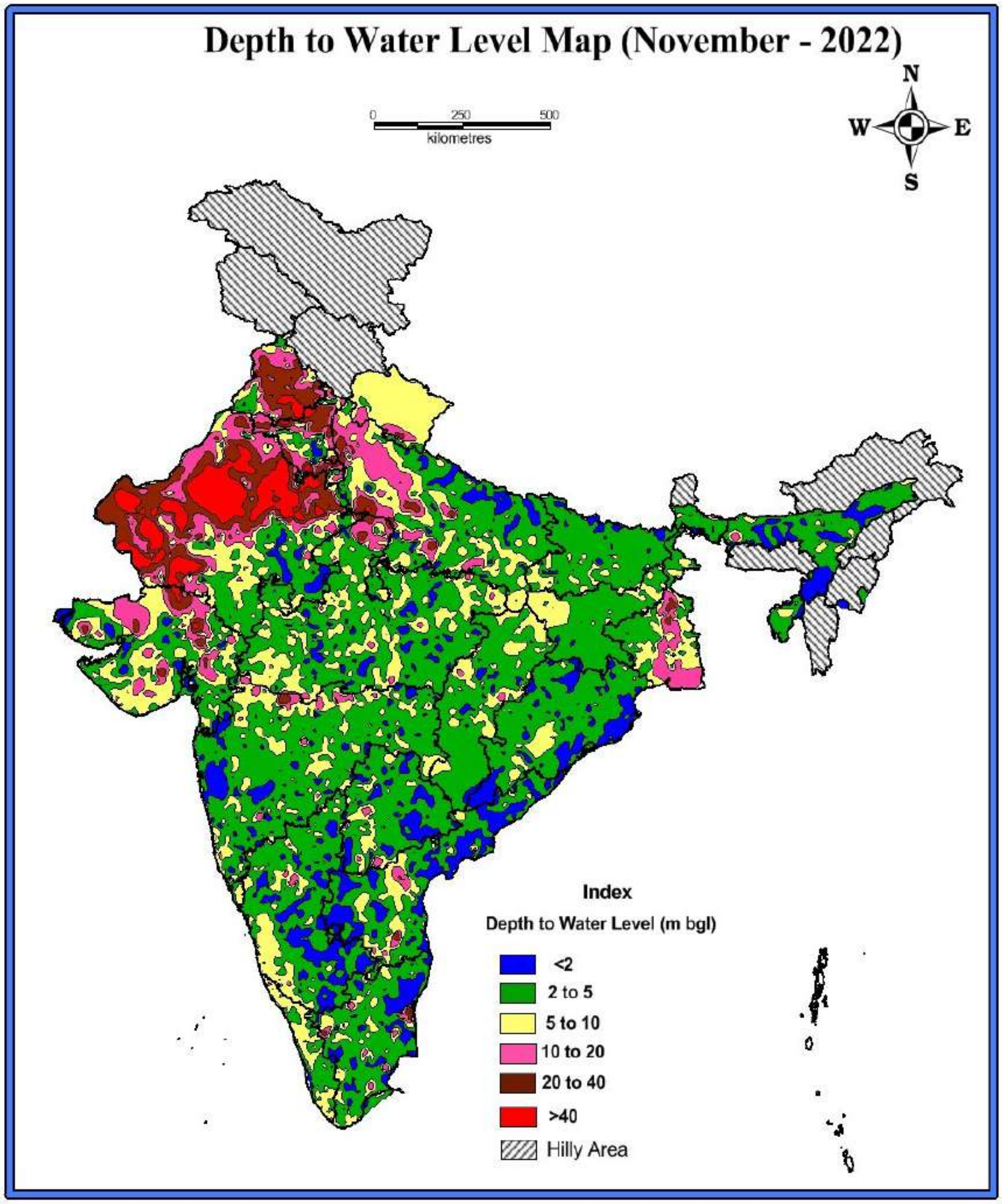


Fig-5.2: Post-monsoon Depth to Water Level Map (2022)

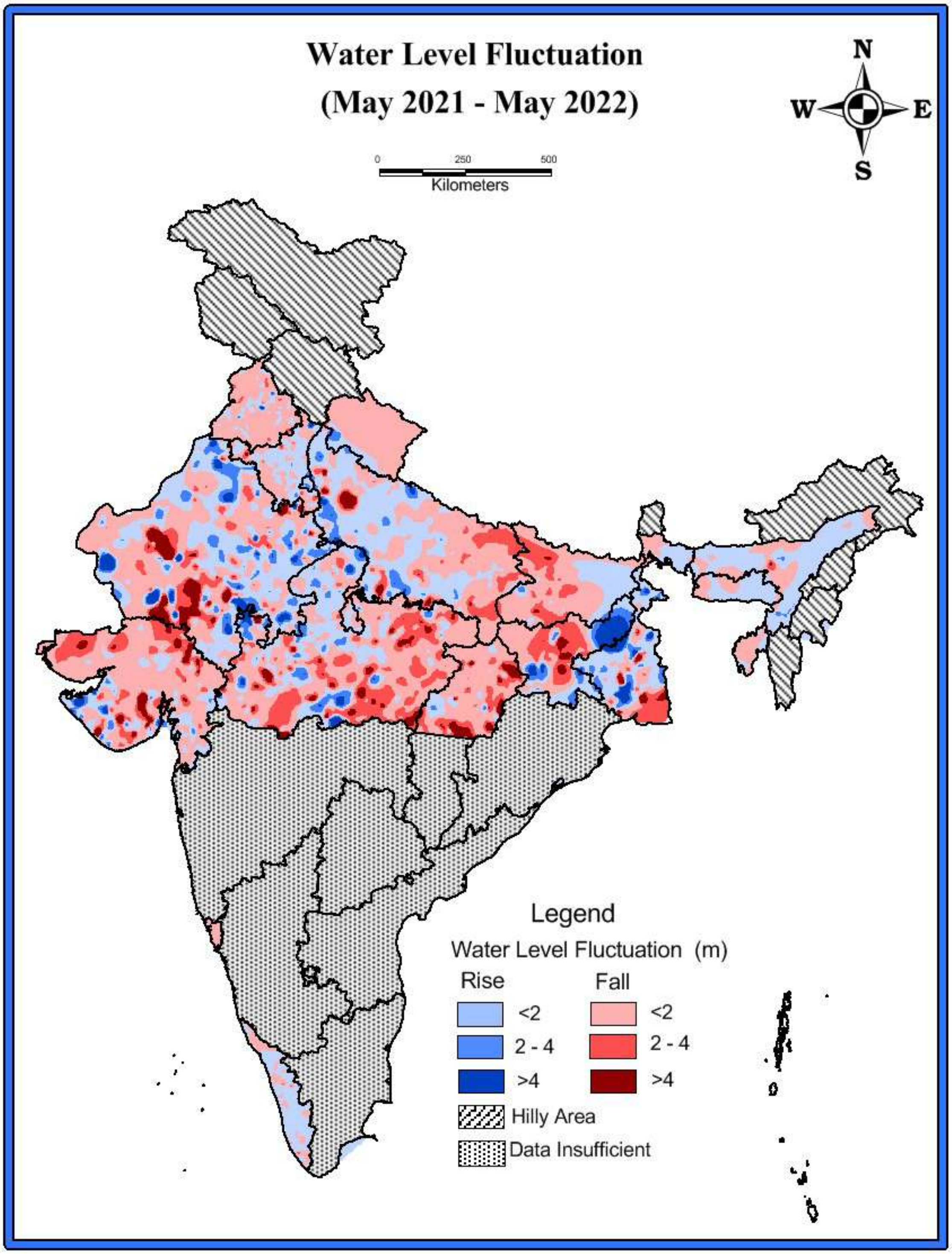


Fig-5.3: Groundwater Level Fluctuation: Pre-monsoon 2021 compared to Pre-monsoon 2022

***** Insufficient monitoring in May 2021 due to restrictions imposed because of lock down due to COVID pandemic.

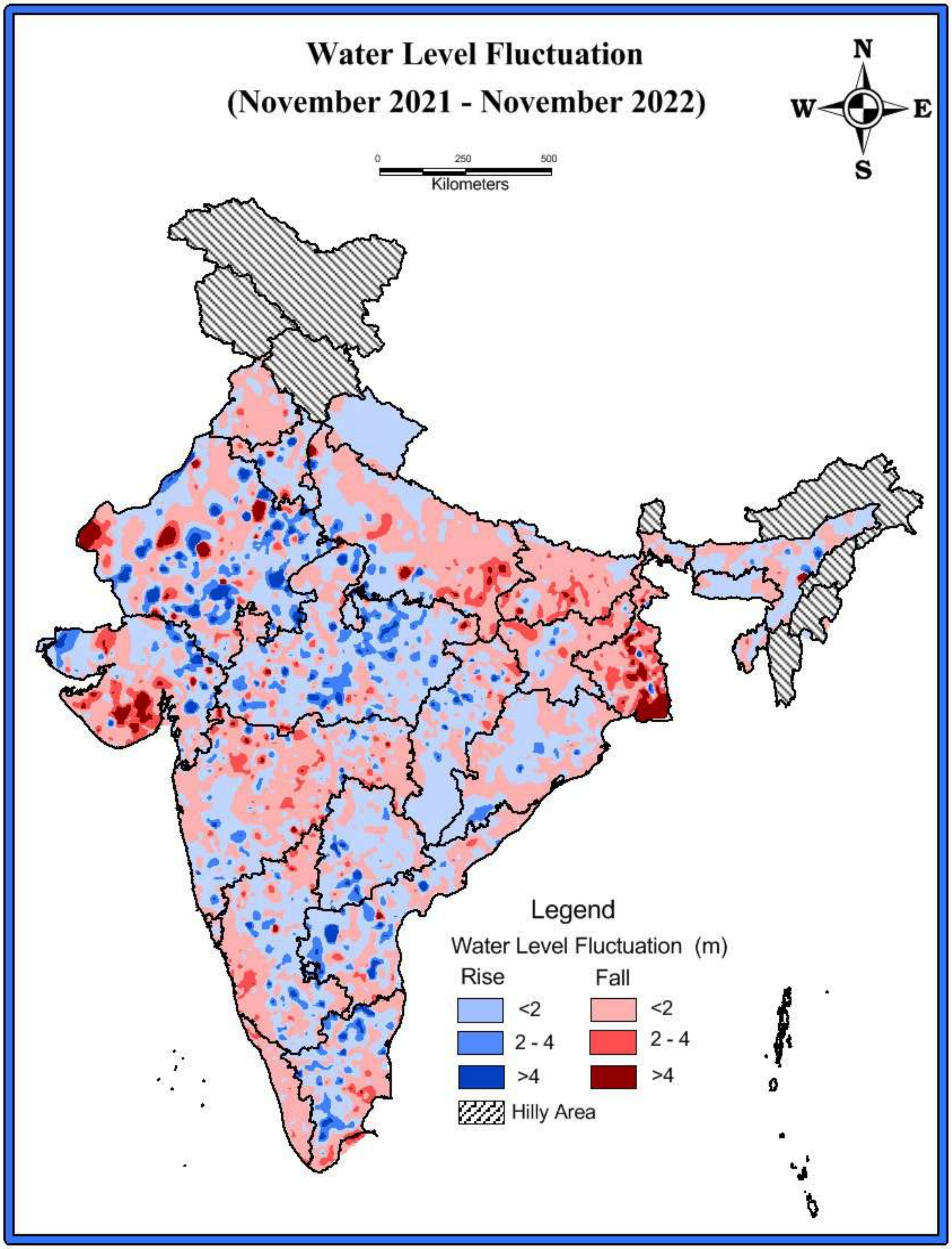


Fig-5.4: Groundwater Level Fluctuation: November 2021 compared to November 2022

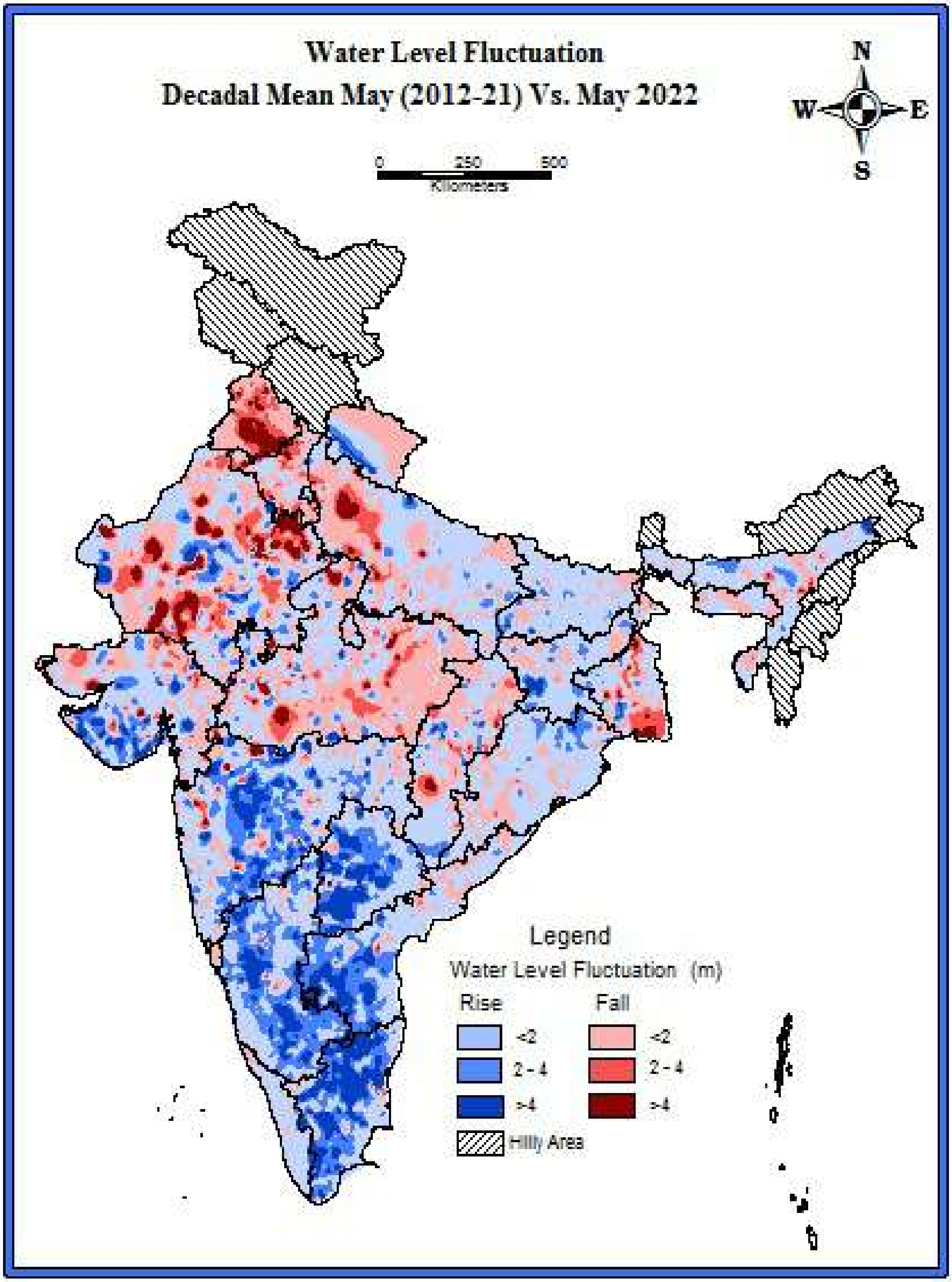


Fig-5.5: Decadal water level fluctuation with mean Pre-Monsoon (2012 to 2021) and Pre-Monsoon 2022

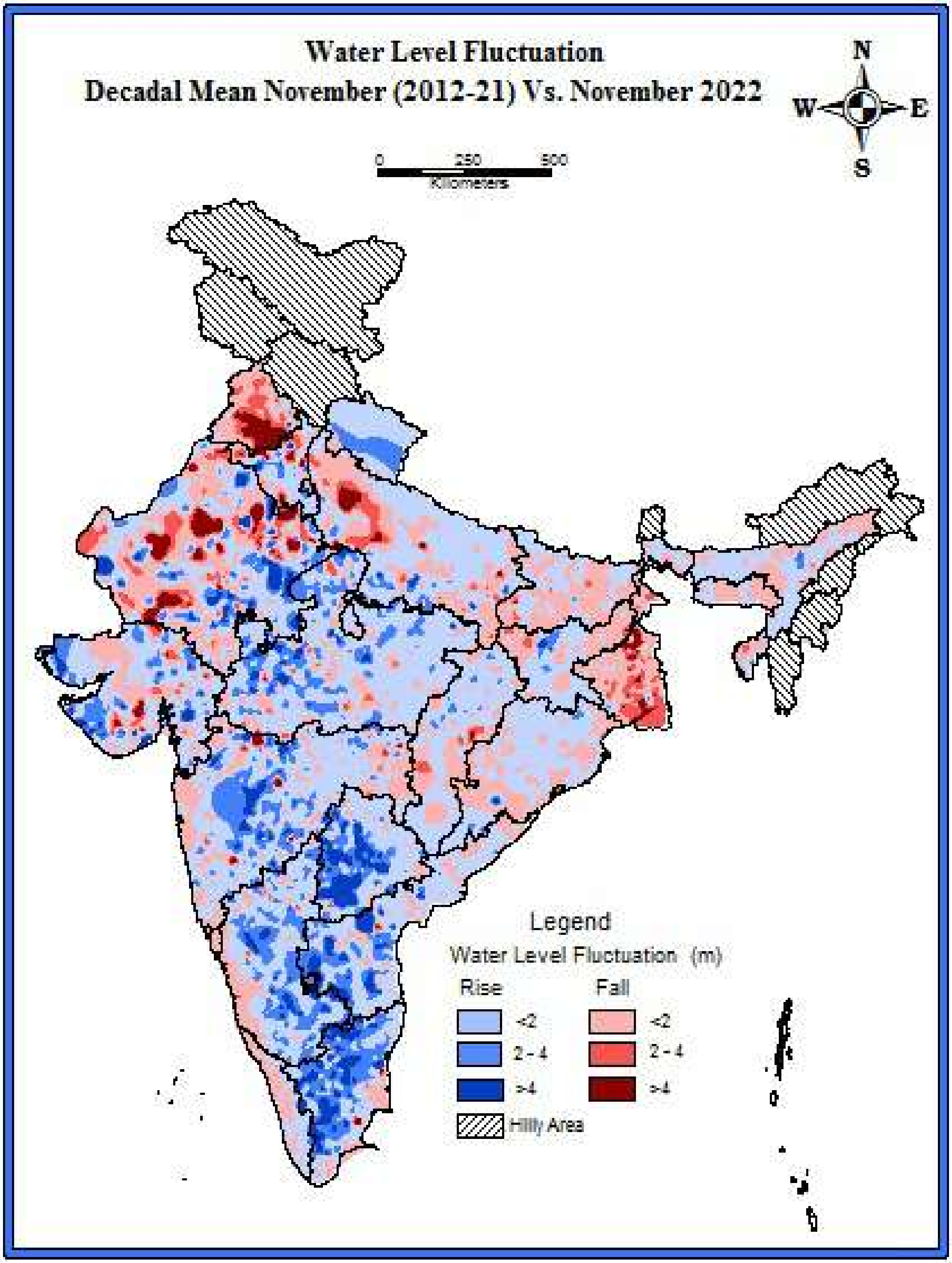


Fig-5.6: Decadal water level fluctuation with mean Post-Monsoon (2012 to 2021) and Post-Monsoon 2022

CHAPTER 6

6.0 GROUND WATER RESOURCES OF INDIA

The Dynamic ground water resources (as in 2023) 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. Methodology adopted for the assessment has been outlined in Chapter-2 of this report. This section provides a summary of the Ground water Resources Assessment 2023 (GWRA-2023) made for the country.

6.1 DYNAMIC GROUND WATER RESOURCES

As per the 2023 assessment of Dynamic Ground Water Resources, the Total Annual Ground Water Recharge for the entire country has been assessed as 449.08 billion cubic meter (bcm) and Total natural discharges works out to be 41.89 bcm. Hence, Annual Extractable Ground Water Resources for the entire country is 407.21 bcm.

Rainfall recharge during monsoon and non-monsoon period is the major contributor of total annual groundwater recharge of the country, which is 270.78 bcm or 60% of the total recharge (Monsoon season: 54%, Non-monsoon season: 6%) and the remaining 40%(Monsoon season: 19%, Non-monsoon season: 21%) or 178.31 bcm is from 'Other sources'viz. canal seepage, return flow from irrigation, recharge from tanks, ponds and water conservation structures taken together. (***Fig-6.1***). The contribution in Annual Ground Water Recharge from rainfall during monsoon season is more than 70% in the states/UT of Assam, Goa, Gujarat, Jharkhand, Kerala, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Rajasthan, Daman & Diu, and Lakshadweep (***Fig- 6.2***). The overall contribution of rainfall (both monsoon & non-monsoon) recharge to country's total annual ground water recharge is 60% and the share of recharge from 'Other sources' viz. canal seepage, return flow from irrigation, recharge from tanks, ponds and water conservation structures taken together is 40%.

State-wise Ground Water Resources of India (as in 2023) are given in **Annexure-I** and the district-wise figures for each State are given in **Annexure-II**. The over-all scenario of ground water resource and extraction in the country is given in ***Fig-6.1, 6.2, 6.3, 6.4 & 6.5*****.**

Volumetric estimates are dependent on the areal extent of the assessment units. In order to compare the ground water resource of different assessment units, the volumetric estimates of annual ground water recharge have been converted to depth units (m) by dividing the annual ground water recharge by the area of the respective assessment units (km^2). Spatial variation in annual ground water recharge (m) is shown in **Fig-6.3.** Annual Ground Water Recharge is significantly high in the Indus-Ganga-Brahmaputra alluvial belt in the North, East and North East India covering the states of Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal and valley areas of North Eastern States, where rainfall is plenty and thick piles of unconsolidated alluvial formations are conducive for recharge. Annual Ground Water Recharge in these regions varies from 0.25 to more than 0.5 m. The coastal alluvial belt particularly Eastern Coast also has relatively high annual ground water recharge, in the range 0.25 to more than 0.5 m. In western India, particularly Rajasthan and parts of northern Gujarat that have arid climate, the annual ground water recharge is scanty, mostly up to 0.025 m. Similarly, in major parts of the southern peninsula covered with hardrock terrains, annual ground water recharge mostly ranges from 0.10 to 0.15 m. This is primarily because of comparatively low infiltration and storage capacity of the rock formations prevailing in the region. The remaining part of Central India is mostly characterized by moderate recharge in the range of 0.10 to 0.25 m.

The overall estimate of Annual Ground Water Recharge for the entire country shows an increase of 11.48 bcm in the present assessment as compared to the last assessment i.e. 2022. The Annual Extractable Ground Water Resources shows an increase of 9.13 bcm. The Annual Ground Water Extraction for irrigation, domestic and Industrial uses has increased by 2.18 bcm.

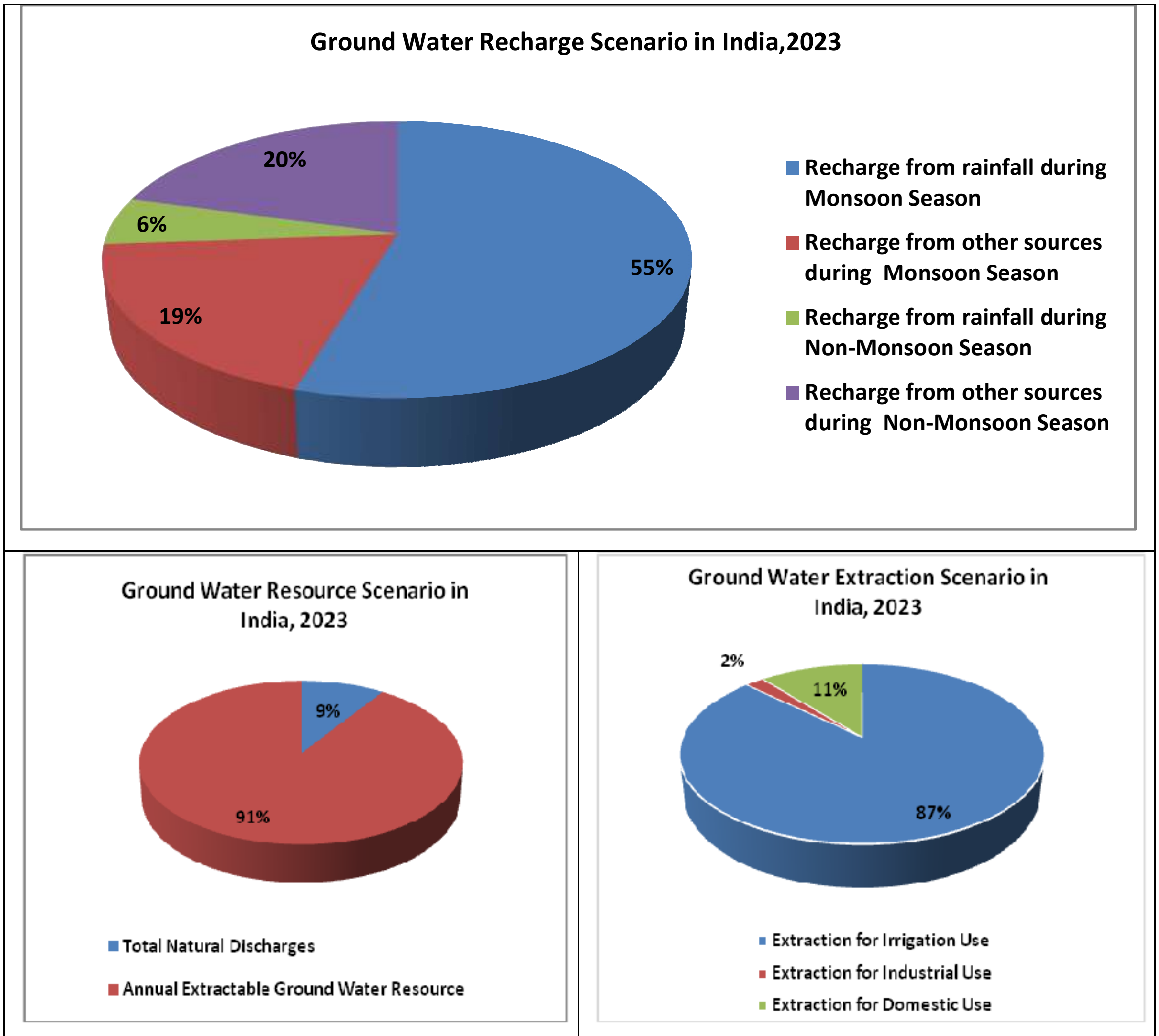


Fig-6.1: Ground Water Resources and Extraction Scenario in India, 2023

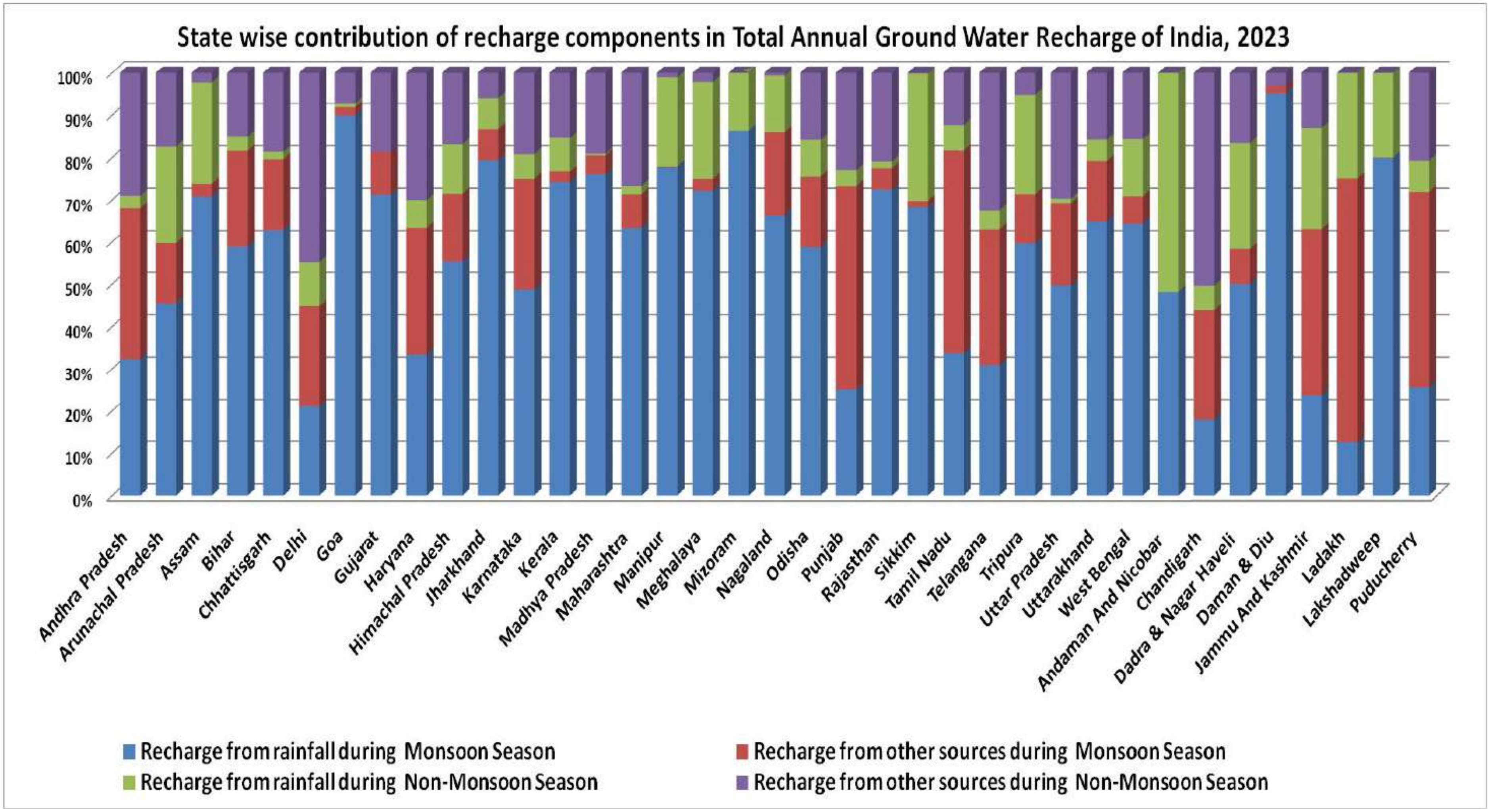


Fig-6.2: State wise contribution of recharge components in Total Annual Ground Water Recharge of India, 2023

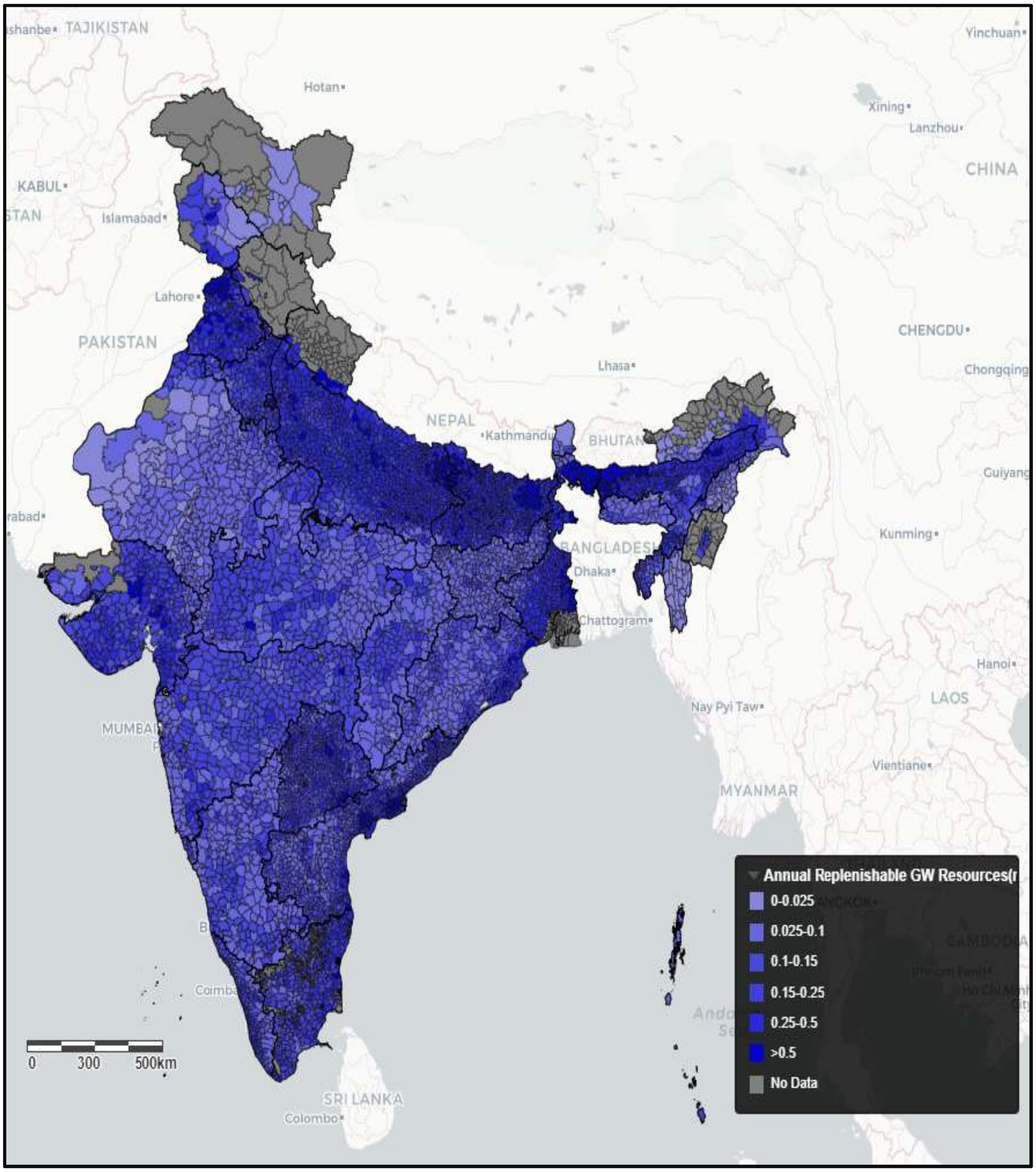


Fig. 6.3: Spatial variation in annual ground water recharge (in m), 2023

6.2 GROUND WATER EXTRACTION

The assessment of ground water extraction is carried out considering the Minor Irrigation Census data and sample surveys carried out by the State Ground Water Departments. The Total Annual Ground Water Extraction of the entire country for the year 2023 has been estimated as 241.34 bcm. The agriculture sector is the largest consumer of groundwater resources, accounting for 87% of the total annual groundwater extraction, which amounts to 209.74 bcm. The domestic use accounts for 11% (27.57 bcm), while industrial use represents 2% (4.01 bcm) of total annual groundwater extraction of the Country. In the states/UTs of, Arunachal Pradesh, Delhi, Goa, Kerala, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Andaman and Nicobar, Chandigarh, Jammu and Kashmir, Ladakh, Lakshadweep the ground water extraction for domestic uses is more than 40 % **(*Fig-6.4*).**

6.3 STAGE OF GROUND WATER EXTRACTION

The overall stage of groundwater extraction in the country is 59.26%.The stage of ground water extraction is very high in the States/UTs of Haryana, Punjab, Rajasthan, Dadra & Nagar Haveli and Daman & Diu 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 Delhi, Tamil Nadu, Uttar Pradesh, Karnataka and UTs of Chandigarh, Lakshadweep and Puducherry, the stage of ground water extraction is between 60-100%. In rest of the states/UTs, the stage of ground water extraction is below 60 %.

6.4 CATEGORIZATION OF ASSESSMENT UNITS

Out of the total 6553assessment units (Blocks/ Taluks/ Mandals/ Districts/Valleys), 736 (11.23%) has been categorized as 'Over-exploited', 199 (3.04%)as 'Critical', 698 (10.65%)as 'Semi-critical', and 4793 (73.14%)units as 'Safe'. There are 127 (1.94%) assessment units, which are completely saline. The State-wise and District-wise numbers of assessment units under different categories are given in **Annexure III (A) and Annexure III (B)** respectively. The percentage of Over-exploited and Critical administrative units more than 25% of the total units are in Delhi, Haryana, Punjab, Rajasthan, Tamil Nadu, Dadra & Nagar Haveli ,Daman & Diu(***Fig-6.5***). The State-wise name of the assessment units under Over-exploited, Critical and Semi-critical categories and Quality problems in assessment units are given in **Annexure IV (A) and Annexure IV (B)** respectively. Similarly out of 24.64 lakh sq km recharge worthy area of the country, 4.18lakh sq km (16.95%) are under 'Over-Exploited', 0.86 lakh sq km (3.49 %) are under 'Critical', 2.92 lakh sq km (11.85%) are under 'Semi-Critical', 16.30 lakh sq km (66.15 %) are under 'Safe' and 0.38lakh sq km (1.55%) are under 'Saline' category assessment units. State-wise and District-wise details are given in **Annexure III (E) and Annexure III (F)** respectively. Out of 407.21bcm of Total Annual Extractable Resources of the country, 45.12bcm (11.08%) are under 'Over-Exploited', 12.91 bcm (3.17%) are under 'Critical', 47.37bcm (11.63%) are under 'Semi-Critical', 301.80 bcm (74.11%) are under 'Safe' category assessment units. State/UT-wise and District-wise details are given in **Annexure III (C) and Annexure III (D)** respectively.

The state wise summary of assessment units improved or deteriorated from 2022to 2023assessment and detailed comparison of categorization of assessment units from 2022and 2023are given in **Annexure V (A) and Annexure V(B)** respectively**.**

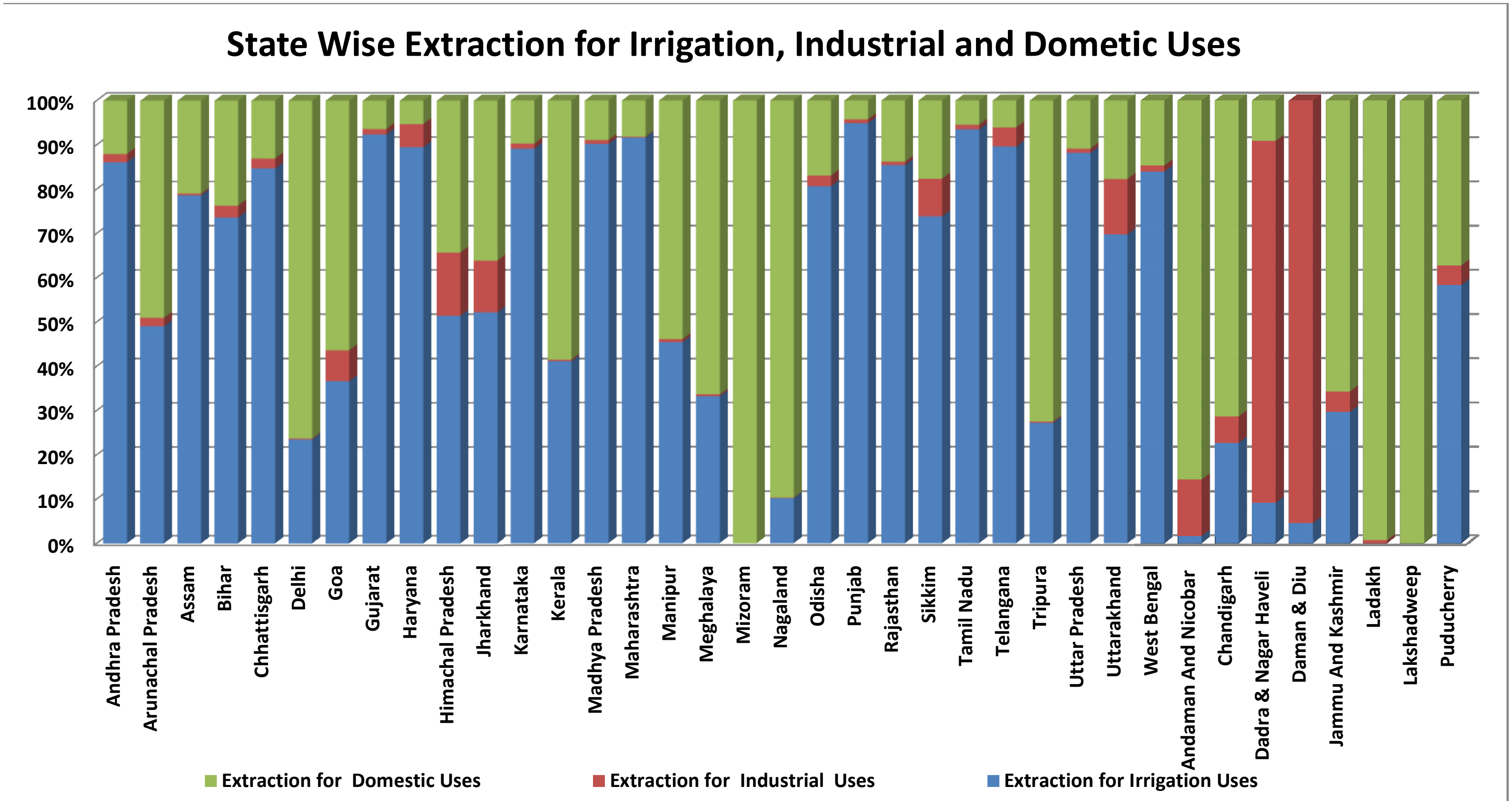


Fig-6.4: State wise % of Groundwater extraction for Irrigation vs. Industrial and Domestic Purposes

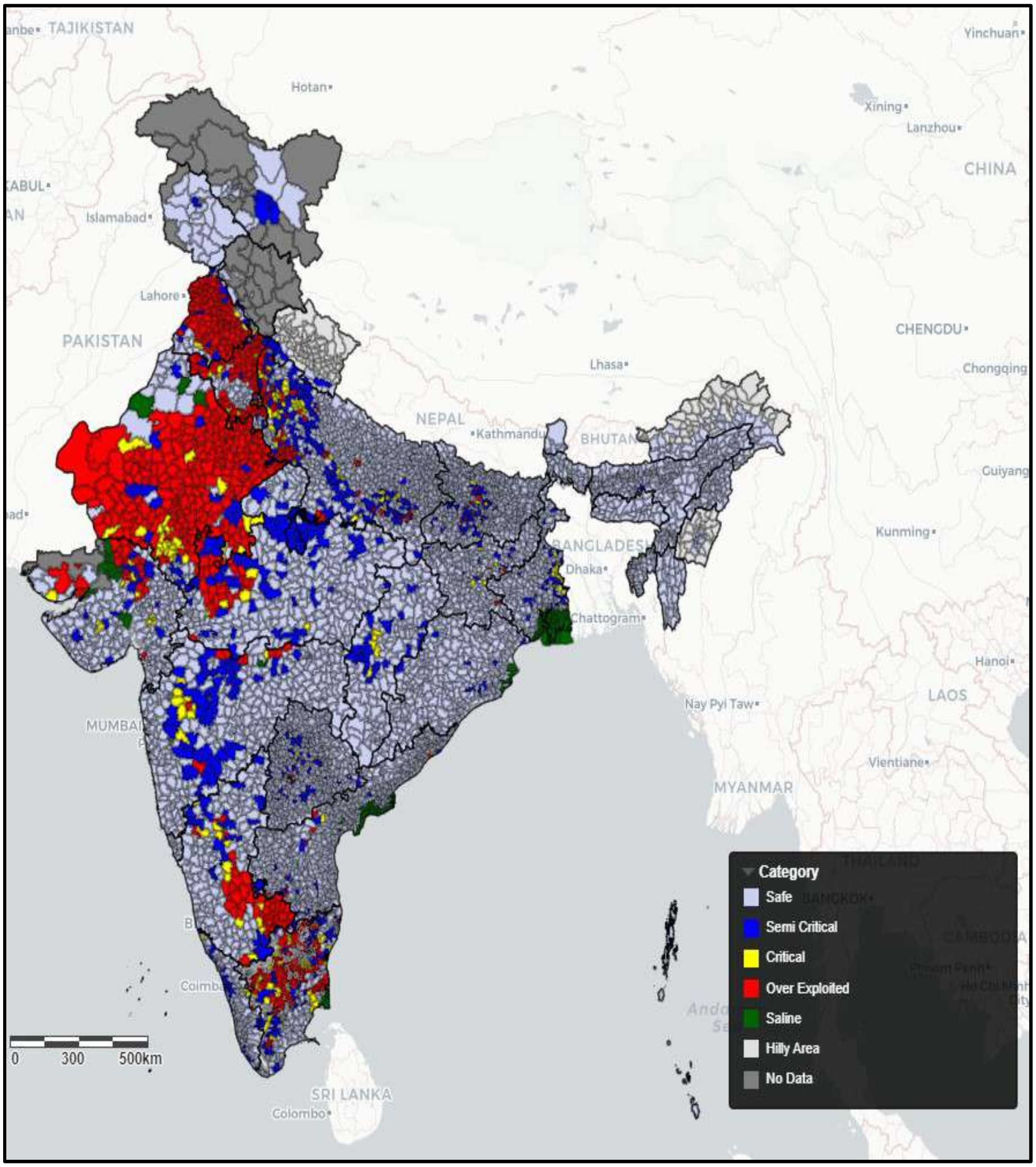


Fig-6.5: Categorization of Assessment Units

6.5 INTEGRATION OF GROUND WATER AND SURFACE WATER DATA WITH A VIEW TO FACILITATE PLANNING FOR CONJUNCTIVE USE OF WATER RESOURCES

Assessment of ground water resources is based on the principle of water balance using the equation 'Inflow – Outflow = Change in Storage (of an aquifer)'. Major inflow components include recharge due to rainfall and recharge from other sources. Major outflow component is ground water extraction for domestic, irrigation and industrial uses. Vertical flow across the aquifer system, lateral flow along the aquifer system (through flow), transpiration, evaporation and base flow are other important components.

The area of each assessment unit (block/taluk/mandal/tehsil etc.) is divided into command area and non-command area for the purpose of assessment. If an assessment unit is having more than 100 ha area under major and medium irrigation projects then that much area will be considered as command area. For the command area, along with other data/information pertaining to ground water resource assessment, data/information related to canal flows is collected from the relevant agencies for assessing the recharge from canal seepage. Similarly, data related to irrigation water applied in the assessment area from surface and ground water sources in different seasons are estimated for assessing the return flow from irrigation (return flow factor depends upon depth to water level, paddy/non-paddy crops etc.). Recharge from water bodies/tanks/lakes are assessed in the area based on average water spread area and recharge factor. Recharge from water conservation structures in the area are assessed based on the storage capacity, number fillings and recharge factor. All these data/information are collected/compiled for assessment of ground water resource of the assessment units. Based the ground water resources assessed and surface water sources availability, integrated water resource management plan and planning for conjunctive management of surface and ground water can be devised at block/assessment level by the planners. This data/information collected/compiled for assessment will be very useful for local administrators for managing water resources in a holistic and sustainable manner.

CHAPTER 7

7.0 STATE WISE GROUND WATER RESOURCE SCENARIO

The ground water conditions, its availability and utilization scenario and categorization of assessment units in different states are given in Annexure I, II, III & IV. State wise summaries are given below.

7.1 ANDHRA PRADESH

The State is divided into 667 assessment units (Mandals) .The State is predominantly covered by hard rocks.As much as 80% of the State is underlain by hard rock formations like Archaeans, Pre-Cambrians, Cuddapahs, Kurnools and Deccan traps. The remaining 20% is underlain by soft rocks including Gondwanas, Rajahmundry sandstone and Recent Alluvium.

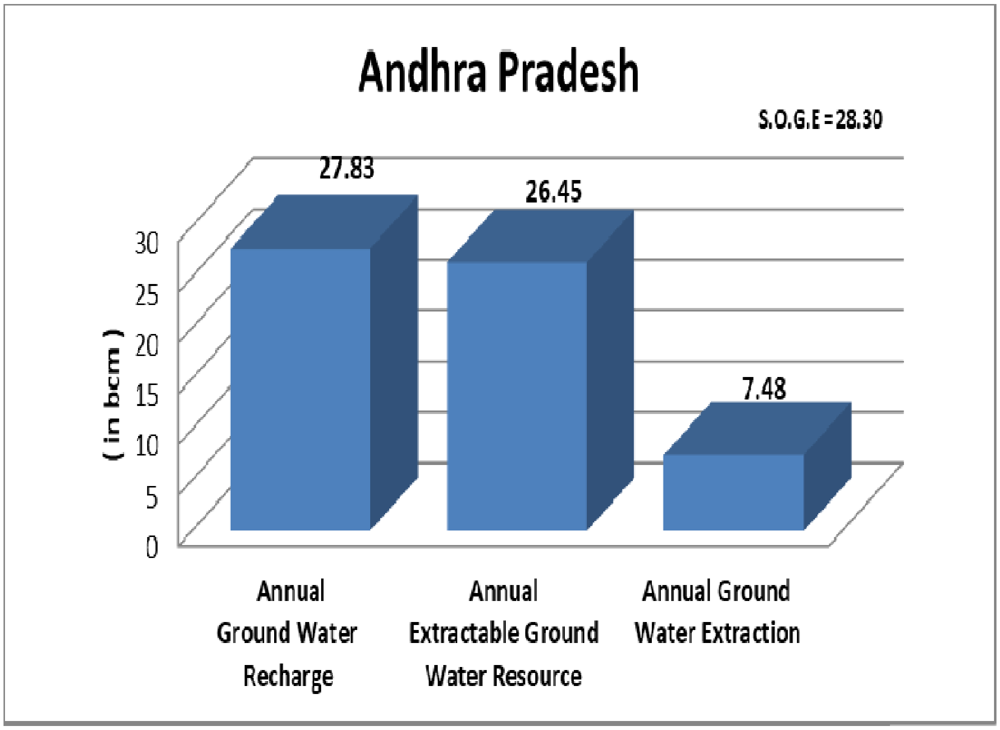
The Ground water resources have been assessed watershed wise and are apportioned to mandals. The Total Annual Ground Water Recharge of the State has been estimated as 27.83 bcm and Annual Extractable Resource is 26.45 bcm. The current Annual Ground Water Extraction for all uses is 7.48 bcm and Stage of Ground Water Extraction is 28.3 %.

Out of 667 assessment units (mandals), 10 (1.5%) units have been categorized, as 'Over-exploited', 03 units (0.45%) as 'Critical', 18 units (2.7%) as 'Semi-Critical', 597 units (89.5 %) as 'Safe' and 39 units categorized as 'Saline' (5.85%).

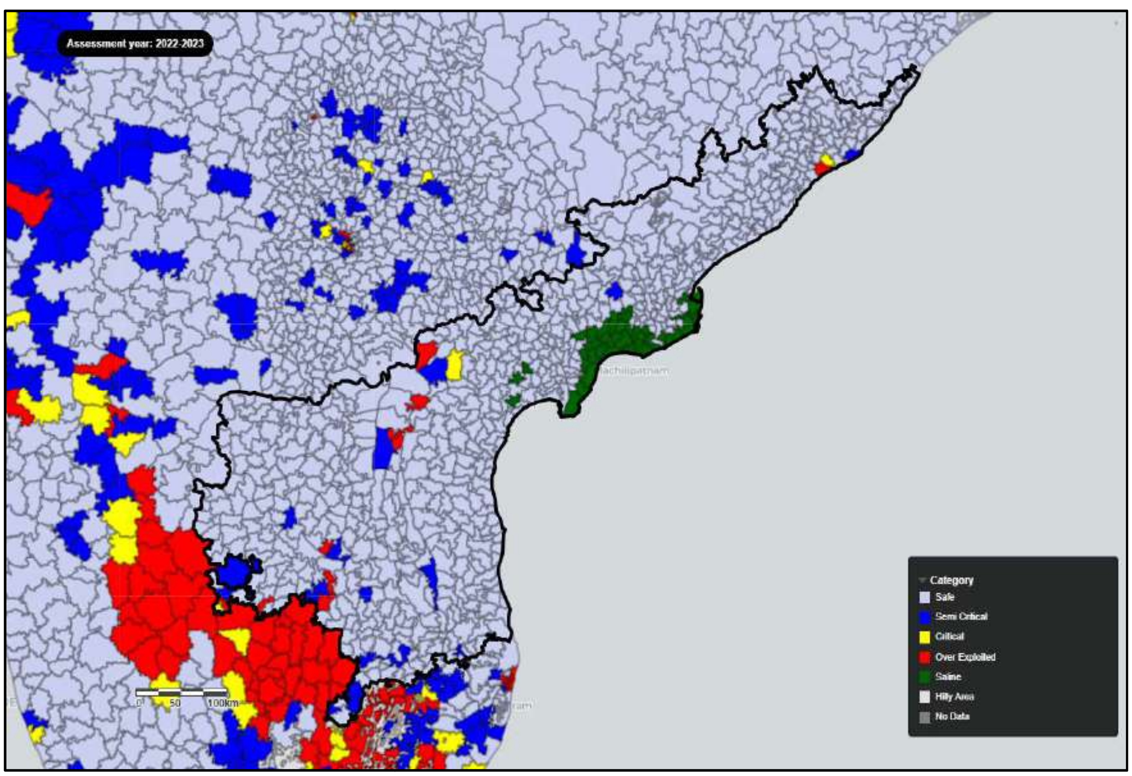
Similarly, out of 139599.85sq km recharge worthy area of the State, 1886.36 sq km (1.35 %) area are under 'Over-Exploited', 775.78 sq km (0.56 %) under 'Critical', 3936.09 sq km (2.82 %) under 'Semi-critical', 126905.3 sq km (90.91 %) under 'Safe' category of assessment units. 6096.33 sq km (4.37%) area is under 'Saline' category of assessment units.

Out of total 26445.91 mcm annual extractable ground water resources of the State, 221.8 mcm (0.84%) are under 'Over-exploited', 77.62 mcm (0.29 %) under 'Critical', 489.85 mcm (1.85 %) under 'Semi-critical' and 25656.64 mcm (97.02 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, the total Annual Ground Water Recharge for the State has increased from 27.23 bcm to 27.83 bcm, which is attributed to excess rainfall, increase in surface water impoundments, government interventions, e.g. water conservation activities. Similarly, the annual extractable groundwater resources of the State increased from 25.86 bcm to 26.45 bcm. The annual groundwater extraction has increased marginally from 7.45 to 7.48 bcm in the State. The stage of groundwater extraction of the state decreased marginally from 28.81% to 28.3% in the current assessment indicating overall improvement in ground water scenario.



Dynamic Ground water Recourses Scenario 2023 - Andhra Pradesh



Categorization Map of GWRA 2023 – Andhra Pradesh

7.2 ARUNACHAL PRADESH

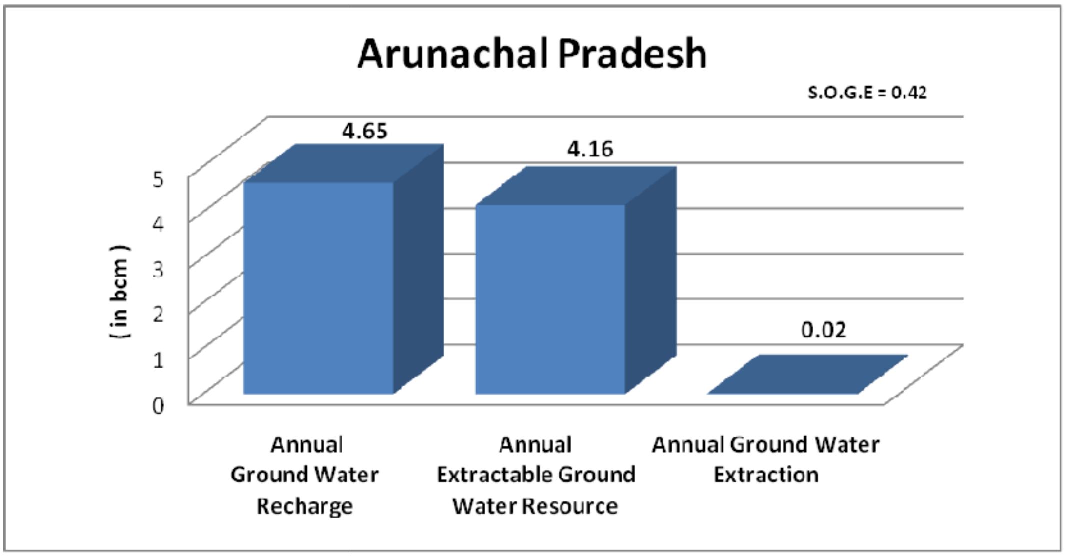
The state of Arunachal Pradesh is underlain by diverse rock types of different geological ages from Pre-Cambrian to Recent. Major part of the state is covered with consolidated crystalline rocks and meta-sediments of Precambrian and Palaeozoic age, while Tertiary sediments consisting of semi-consolidated argillaceous assemblage, represented by the Disang, Barail, Tipam, Siwalik and Dihing groups of rock, occupy periphery areas bordering Assam and behave as run-off and in select patches functions as infiltration zone. In consolidated formations, ground water potential appears to be limited. Semi-consolidated Tertiary formations are likely to give moderate or poor yield and expected to be controlled by aquifer geometry and structural features. Ground water in both consolidated and semi-consolidated formations also manifests as springs and in all geological formation springs occur as both seasonal and perennial in nature.

Unconsolidated Quaternary sediments comprising the terrace deposits of Pleistocene (Bhabar zone) and also the terrace and alluvial fan deposits of Holocene age prevail in the fringe valley areas and as thin carpet in isolated structural valley sand with considerable thickness in open and wide valleys joining Brahmaputra Alluvial plains. The unconsolidated alluvial sediments in the valley areas act as good repositories for ground water development. Valleys adjoining Assam are most promising where good thickness of granular zones is distributed. Discharge of the deep tube wells, tapping mostly unconsolidated Quaternary sediments & at places Upper Tertiary formations, varies from 1.4m^3/hr to 54m^3/hr, while transmissivity ranges from 1 to 661m^2/day. Storativity ranges from 0.35×10^{-3} to 6.65×10^{-3}

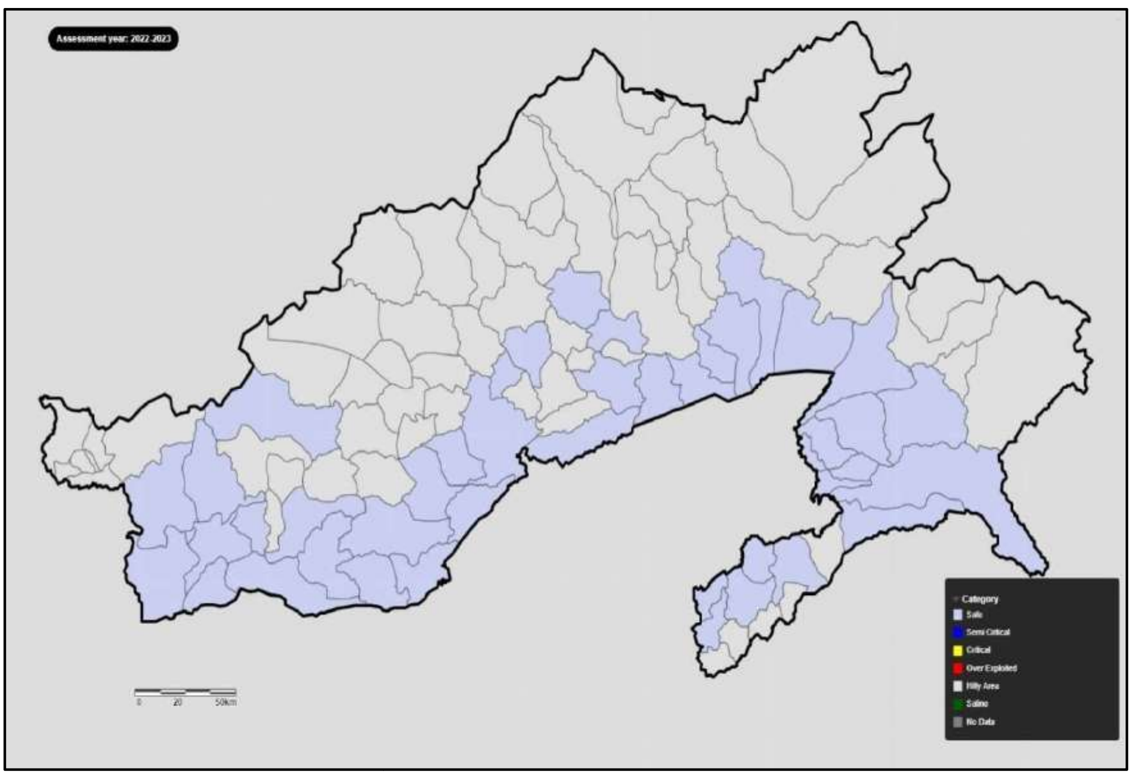
The ground water resource estimation of the state has been done block-wise by considering 42 nos. of groundwater recharge worthy blocks as assessment unit. The Total Annual Groundwater Recharge of the State has been estimated as 4.65 bcm and Annual Extractable Groundwater Resources is 4.16 bcm. The Current Annual Ground Water Extraction for all uses is 0.02 bcm and Stage of Ground Water Extraction is 0.42 %. All the 42 assessment units have been categorized as 'Safe'. There is no saline area in the state.

Similarly out of 5721.38 sq km recharge worthy area of the State, 5721.38 sq km (100 %) under 'Safe' categories of assessment units. Out of total 4163.11 mcm annual extractable ground water resources of the State, 4163.11 mcm (100 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, the Total Annual Ground Water Recharge for the State has increased from 4.52 bcm in 2022 to 4.65 bcm in 2023, Annual Extractable Ground Water Resources increased from 4.07 bcm in 2022 to 4.16 bcm in 2023 and Total Ground Water Extraction decreased from 0.03bcm in 2022 to 0.02 bcm in 2023. The Stage of Ground Water Extraction decreased from 0.79 % to 0.42 %.



Dynamic Ground water Recourses Scenario 2023 – Arunachal Pradesh



Categorization Map of GWRA 2023 – Arunachal Pradesh

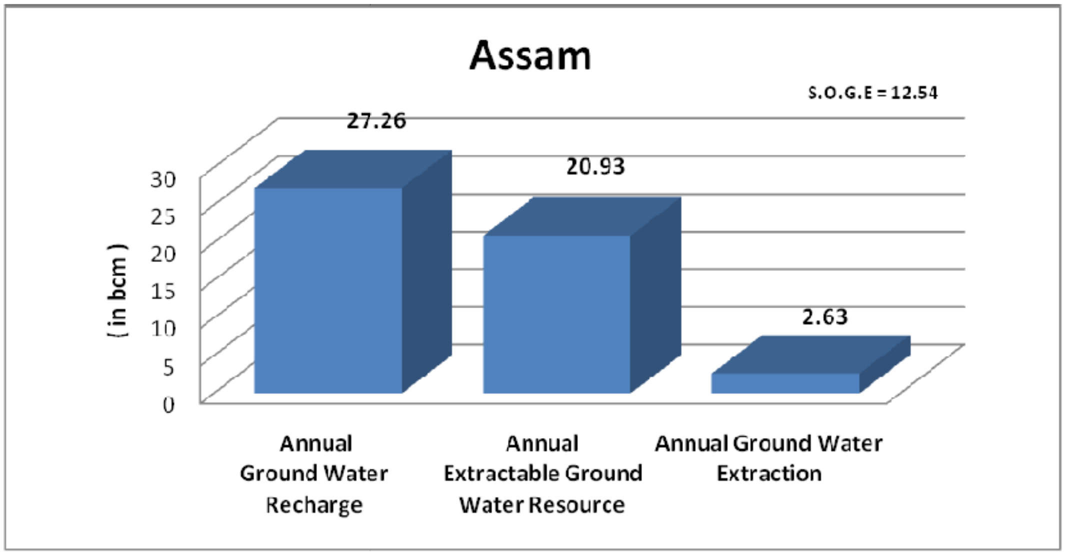
7.3 ASSAM

The State is underlain mainly by unconsolidated Quaternary formation in Brahmaputra valley and potential aquifers lie at shallow as well as deeper zone. The semi-consolidated Tertiary formations are found to occur in the southern part of KarbiAnglong, Cachar, Karimganj and Hailakandi districts and in Upper Assam covering southern fringe of Dibrugarh, Tinsukia, Sibsagar, Jorhat, Golaghatdistricts.The consolidated Precambrian rocks occur mainly in N.C. Hills, Karbi-Anglong, Kamrup, Goalpara, Dhubri, and Nagaon.

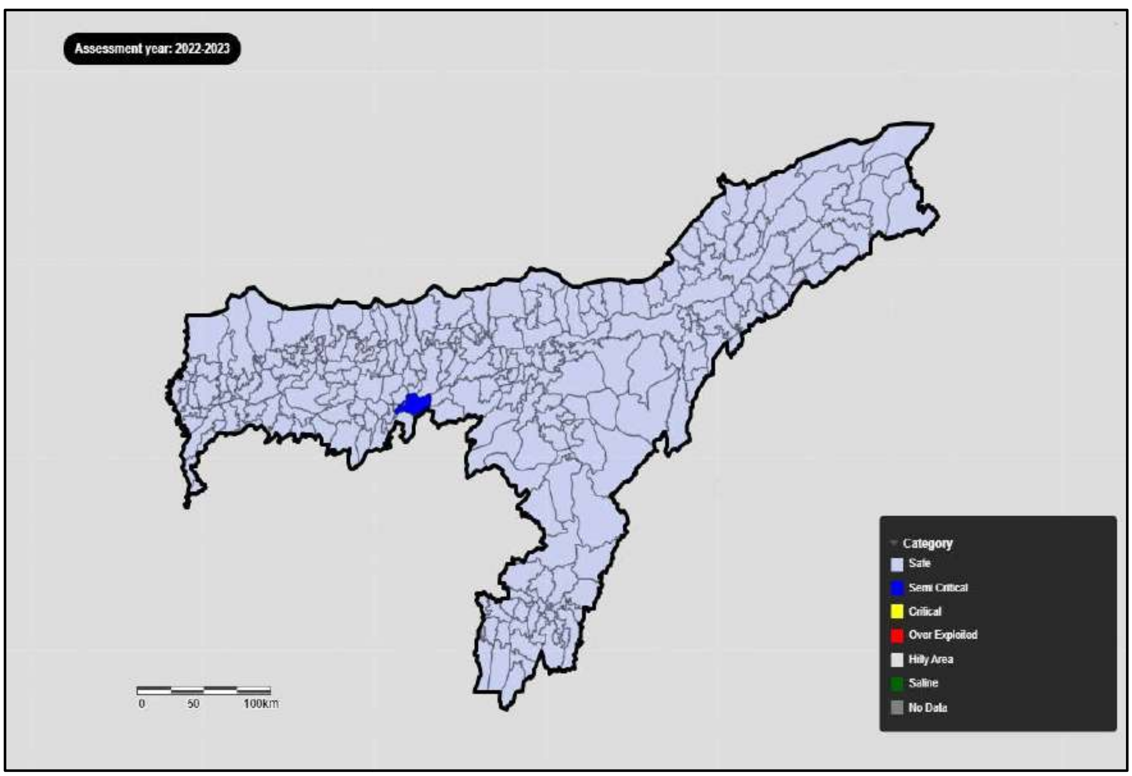
Groundwater resources has been estimated for this year on a block-wise basis for the state. The Total Annual Groundwater Recharge of the State has been estimated as 27.26 bcm and Annual Extractable Groundwater Resources is 20.93 bcm. The Current Annual Ground Water Extraction for all uses is 2.63 bcm and Stage of Ground Water Extraction is 12.54 %. Out of 245 assessment units, 244 have been categorized as 'Safe' and one assessment unit of Kamrup (Metro) Urban is in 'Semi Critical' condition. There is no saline area in the state.

Similarly out of 68817.93 sq km recharge worthy area of the State, 200.42 sq km (0.29 %) under 'Semi-critical', 68617.51 sq km (99.71 %) under 'Safe' categories of assessment units. Out of total 20931.53 mcm annual extractable ground water resources of the State, 41.47 mcm (0.2 %) under 'Semi-critical' and 20890.06 mcm (99.8 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, the Total Annual Ground Water Recharge for the State has increased from 26.53 bcm in 2022 to 27.26 bcm in 2023, Annual Extractable Ground Water Resources increased from 21.40 bcm in 2022 to 20.93 bcm in 2023 and Total Ground Water Extraction decreased from 2.65 bcm in 2022 to 2.63 bcm in 2023. Stage of Ground Water Extraction decreased from 12.38 % to 12.54 %.



Dynamic Ground water Recourses Scenario 2023 – Assam



Categorization Map of GWRA 2023 – Assam

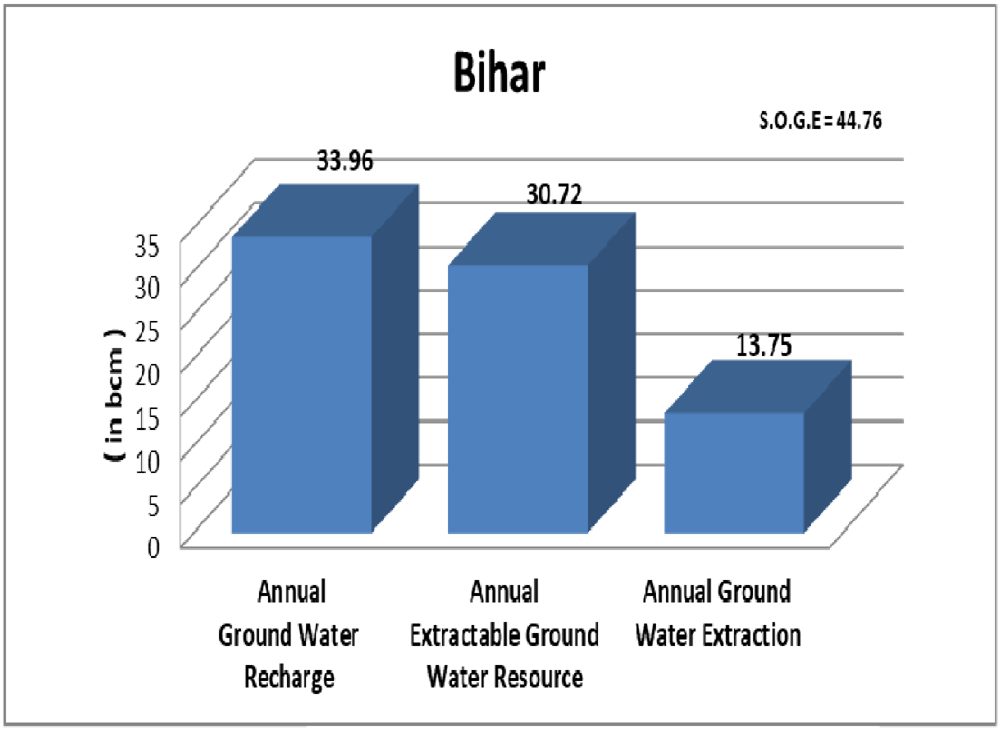
7.4 BIHAR

The State is covered with Gangetic alluvium in more than 89 % of its geographical area. The consolidated formations occupy fringes in the southern parts of the state. Dug wells and shallow tube wells tapping the phreatic zone are the common ground water abstraction structures. The assessment of dynamic ground water resources has been carried out in 535 Assessment Units (534 blocks + Patna Urban) of the State. The Total Annual Ground Water Recharge has been worked out as 33.96 bcm with the Annual Extractable Ground Water Resources as 30.72 bcm. The Current Annual Ground Water Extraction for all uses has been estimated as 13.75 bcm and the Stage of Ground Water Extraction of the State is 44.76 %.

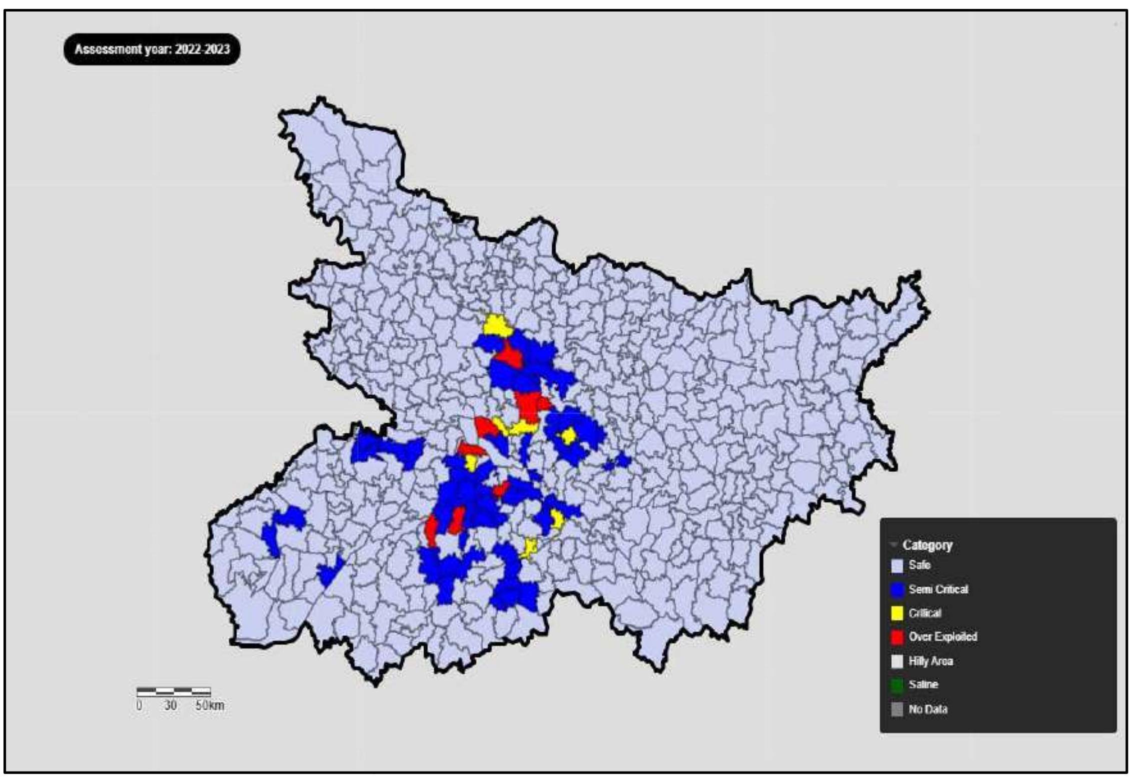
Out of the total 535 assessment units (blocks + Patna Urban), 8 units (1.50 %) are 'Over-exploited', 7 units (1.31 %) are 'Critical', 53 units (9.91 %) are 'Semi-Critical', 467 units (87.29 %) units are 'Safe' category. There is no 'Saline' block in the State.

Similarly out of 90348.70 sq. km recharge worthy area of the State, 867.8 sq km (0.96 %) area are under 'Over-Exploited', 803.91 sq. km (0.89 %) under 'Critical', 7417.08 sq. km (8.21 %) under 'Semi-critical', 81259.91 sq. km (89.94 %) under 'Safe' categories of assessment units. Out of total 30718.81 mcm annual extractable ground water resources of the State, 283.46 mcm (0.92 %) are under 'Over-exploited', 237.4 mcm (0.77 %) under 'Critical', 2168.92 mcm (7.06 %) under 'Semi-critical' and 28029.03 mcm (91.24 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, the Total Annual Ground Water Recharge and Annual Extractable Ground Water Resources for the State have increased from 33.15 to 33.96 bcm and 30.04 to 30.72 bcm respectively. The Annual Ground Water Extraction has increased from 13.5 to 13.75 bcm. Stage of Ground Water Extraction decreased from 44.94% to 44.76 %. This year, the dynamic resources of the State have been estimated separately for canal command and non-command areas. Slight variations in recharge, both from canal sources and rainfall has been observed.. The revival and renovation of tanks and water bodies as part of the Jal Jeevan Hariyali Mission, initiated by the Government of Bihar, resulted in a marginal increase in recharge from surface water sources and surface water irrigation.



Dynamic Ground water Recourses Scenario 2023 – Bihar



Categorization Map of GWRA 2023 – Bihar

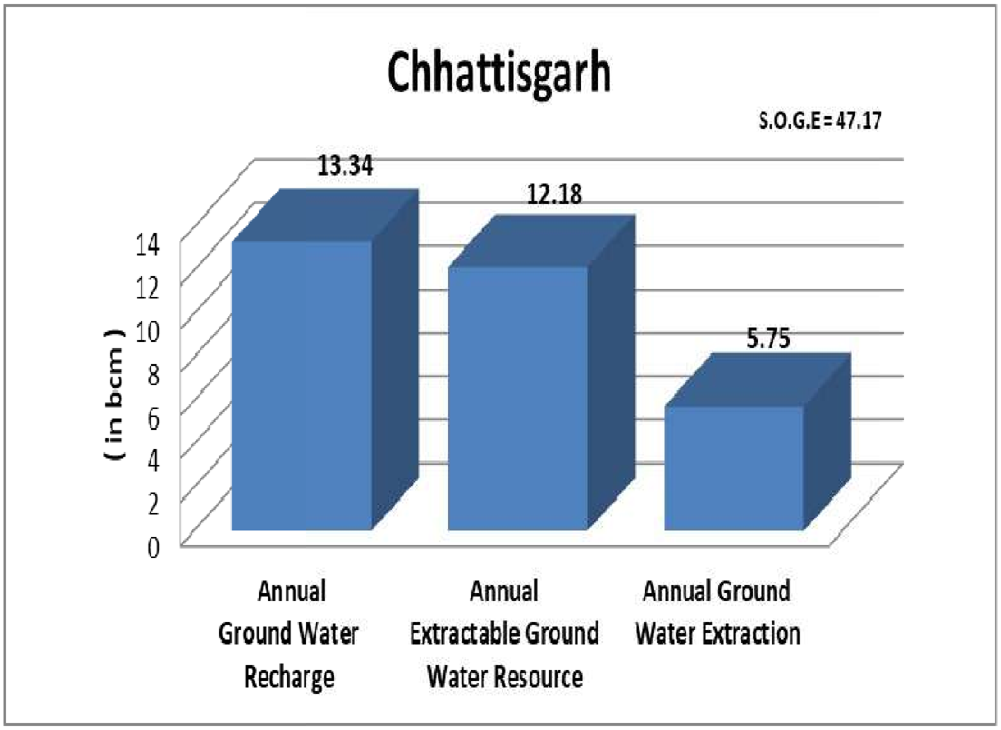
7.5 CHHATTISGARH

The State is underlain by diverse rock types of different geological ages from Pre-Cambrian to Recent. 87% area of the State is underlain by hard rock and the ground water in these areas is being tapped mostly by dug wells constructed in the weathered zone and bore wells tapping the deeper aquifers. The yield of open (dug) wells varies from 1 to 2 lps and the yield of the bore wells ranges from < 1 to 5 lps. About 13 % area of the State is occupied by Semi-consolidated sedimentary rocks where Dug wells & tube wells have yield range of 1 to 10 lps.

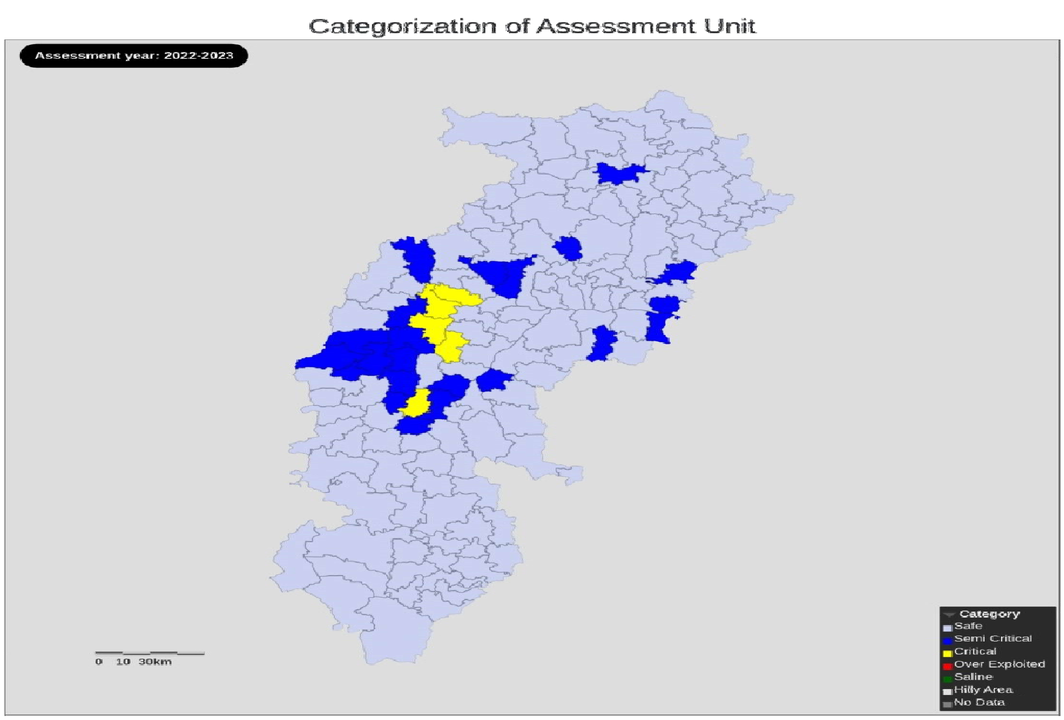
The assessment of ground water resources has been carried out block-wise. The Total Annual Ground Water Recharge of the State has been assessed as 13.34 bcm and Annual Extractable Ground Water Resource is 12.18 bcm. The Total Current Annual Ground Water Extraction is 5.75 bcm and Stage of Ground Water Extraction is 47.17 %.

Out of 146 assessment units (blocks), 5 units (3.42 %) as 'Critical', 22 units (15.07 %) have been categorized as 'Semi-critical' and 119 units (81.51 %) as 'Safe' categories of assessment units. There are no 'Over-exploited' and 'Saline' categories of assessment units in the State. Out of 106078.71 sq. km recharge worthy area of the State, 3119.06 sq km (2.94 %) area are under 'Critical', 13987.35 sq. km (13.19 %) under 'Semi-critical', 88972.30 sq km (83.87 %) under 'Safe' categories of assessment units. Out of total 12183.72 mcm annual extractable ground water resources of the State, 466.98 mcm (3.83 %) under 'Critical', 2288.80 mcm (18.79 %) under 'Semi-critical' and 9427.94 mcm (77.38 %) are under 'Safe' categories.

As compared to 2022 assessment, the Total Annual Ground Water Recharge and Annual Extractable Ground Water Resources for the State have increased from 12.04 to 13.34 bcm and 11.01 to 12.18 bcm respectively. The increase in surface water irrigation area and canal running days along with updated data of ponds and tanks is responsible for increased ground water recharge.There is an increase in ground water extraction from 5.46 to 5.75 bcm. Stage of ground water extraction has decreased from 49.58 % to 47.17 %. Increase in number of irrigation wells resulted in the increase of total extraction.



Dynamic Ground water Recourses Scenario 2023 – Chhattisgarh



Categorization Map of GWRA 2023 – Chhattisgarh

7.6 DELHI

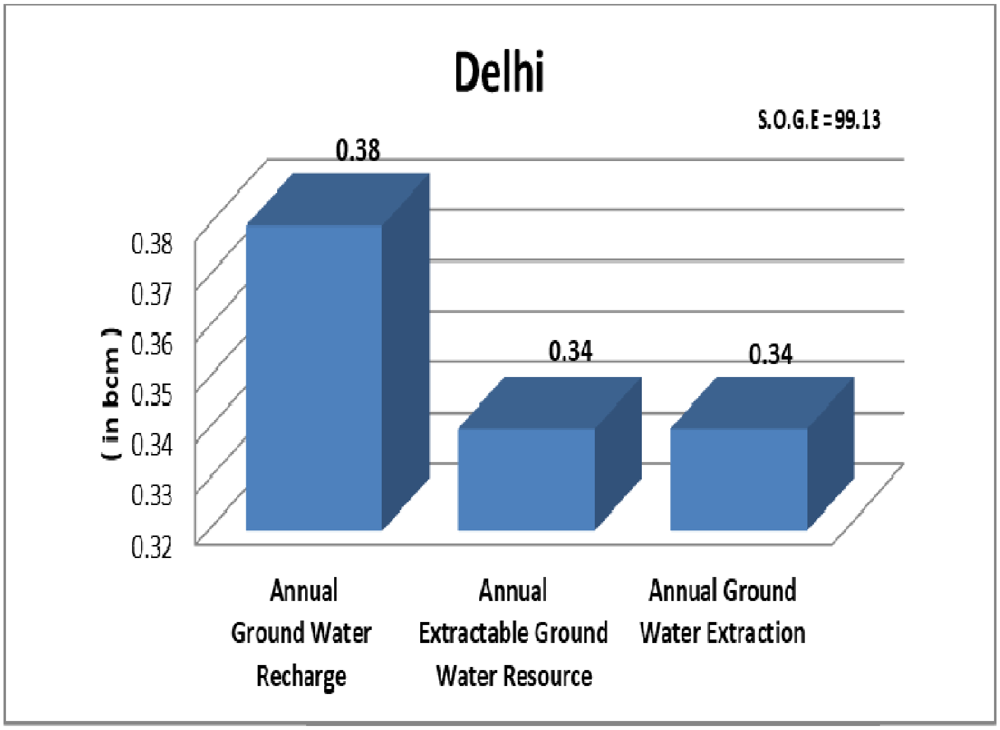
The State is covered by diverse rock types of different geological ages from Pre-Cambrian to Recent. As much as 89% of the State is occupied by alluvium and ground water is being tapped mostly through tube wells. Yields of tube wells vary from 4 to 10 lps in older alluvial deposits and from 25 to 55 lps in newer alluvium. About 11 % of the State is occupied by quartzitic hard rock, where bore wells have yield of 0.6 to 5 lps.

The ground water resources assessment has been carried out tehsil-wise. The Total Annual Ground Water Recharge of the State has been assessed as 0.38 bcm and Annual Extractable Ground Water Resources is 0.34 bcm. The Total Current Annual Ground Water Extraction is 0.34 bcm and Stage of Ground Water Extraction is 99.13 %.

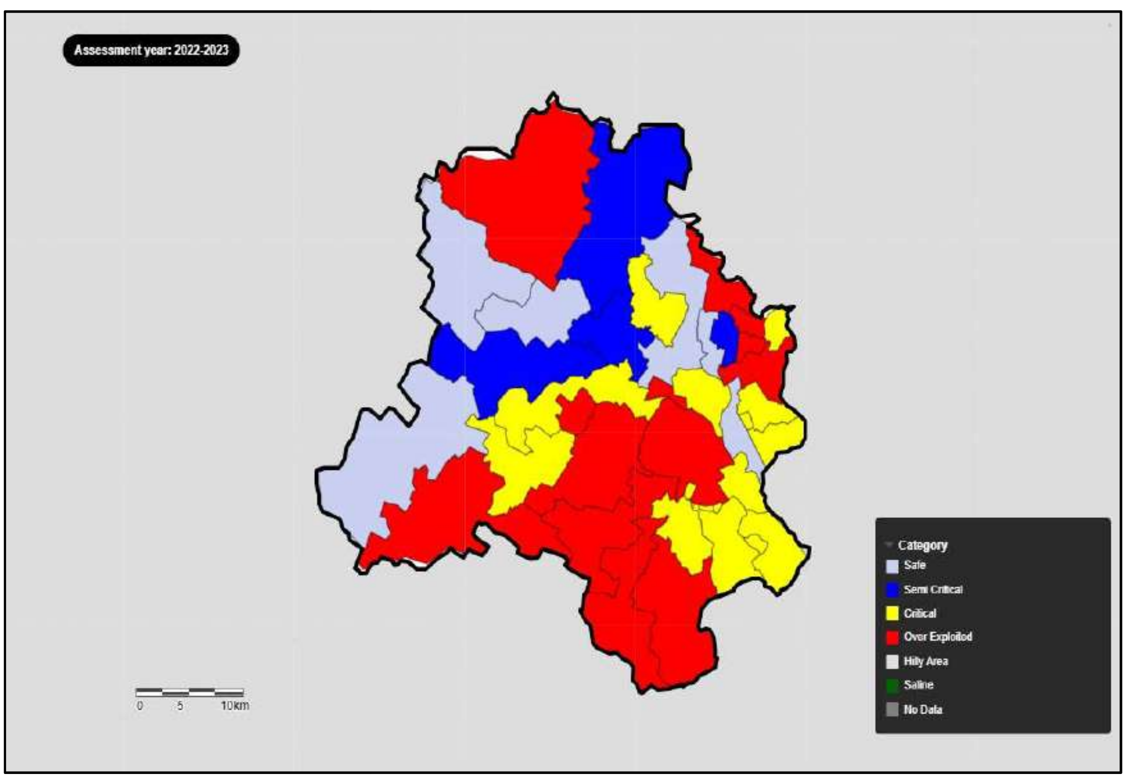
Out of 34 assessment units (tehsils), 13 units (38.24 %) have been categorized as ‘Over-exploited’, 12 units (35.29 %) as ‘Critical’, 4 units (11.76 %) as ‘Semi-critical’, and 5 units (14.71 %) as ‘Safe’ categories of assessment units.

Similarly, out of 1487.61 sq km recharge worthy area of the State, 617.25 sq km (41.49 %) area are under ‘Over-Exploited’, 306.4 sq km (20.6 %) under ‘Critical’, 233.73sq km (15.71 %) under ‘Semi-critical’, 330.23 sq km (22.2 %) under ‘Safe’ categories. Out of total 344.49 mcm annual extractable ground water resources of the State, 122.11 mcm (35.45 %) are under ‘Over-exploited’, 102 mcm (29.61 %) under ‘Critical’, 46.94 mcm (13.63 %) under ‘Semi-critical’ and 73.44 mcm (21.32 %) are under ‘Safe’ categories.

As compared to 2022 assessment, the Total Annual Ground Water Recharge decreased from 0.41 bcm to 0.38 bcm and Annual Extractable Ground Water Resources decreased from 0.37 bcm to 0.34 bcm. The decrease in the total annual groundwater recharge can be attributed to a reduction in recharge from rainfall, resulting from lower precipitation during the current assessment year compared to the previous assessment year. There is decrease in the Annual Ground Water Extraction for the state from 0.36 bcm to 0.34 bcm and the Stage of Ground Water Extraction has increased from 98.16 % to 99.13 %.



Dynamic Ground water Recourses Scenario 2023 – Delhi



Categorization Map of GWRA 2023 – Delhi

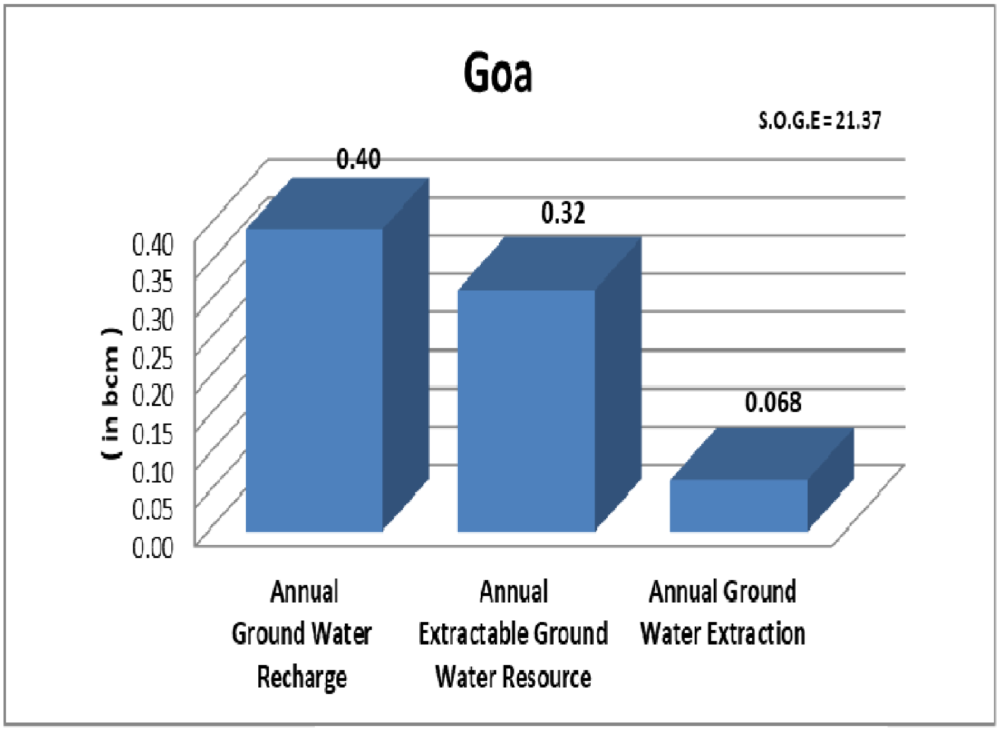
7.7 GOA

Major part of Goa State is covered by consolidated formations of Dharwar Super Group. Ground water occurs under unconfined to semi-confined conditions in beach sands, laterites, weathered and fractured crystalline rocks. The development of ground water from phreatic zone is mostly through dug wells and shallow bore wells.

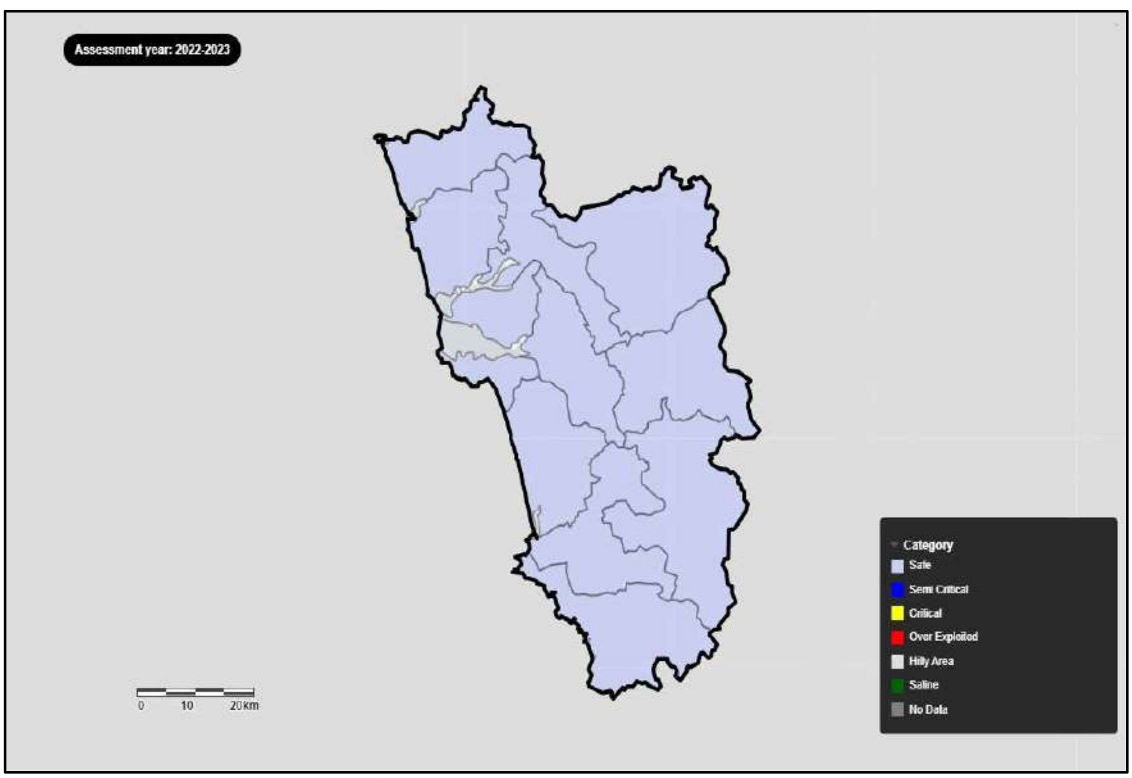
The Ground Water Resources has been assessed taluk-wise. Total Annual Ground Water Recharge has been assessed as 0.396 bcm and Annual Extractable Ground Water Resources as 0.317 bcm. The Annual Ground Water Extraction is 0.068 bcm and Stage of Ground Water Extraction is 21.37 %. All 12 taluks in the State have been categorized as 'Safe'.

Likewise, within the State's 2209.59 sq km of recharge-worthy areas, the entire expanse, falls within the 'Safe' category of assessment units. Out of the State's total annual extractable groundwater resources 317 mcm, the entirety 100%, falls within the 'Safe' category of assessment units.

As compared to 2022 assessment, the Total Annual Ground Water Recharge decreased from 0.41 bcm to 0.398 bcm and Annual Extractable Ground Water Resources decreased from 0.33 bcm to 0.317 bcm. The Annual Ground Water Extraction has also marginally decreased from 0.078 bcm to 0.068 bcm, owing to reduction in domestic draft due to surface water supply under JJM. The Stage of Ground Water Extraction has marginally decreased from 23.63 % to 21.37 %.



Dynamic Ground water Recourses Scenario 2023 – Goa



Categorization Map of GWRA 2023 – Goa

7.8 GUJARAT

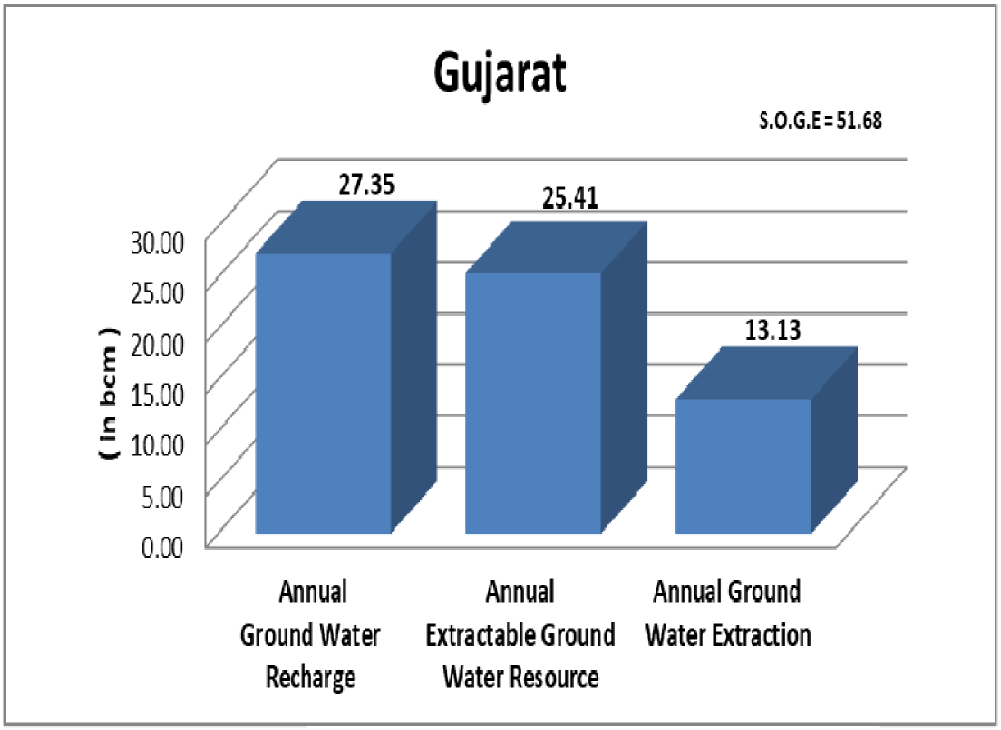
The State is underlain by diverse rock types of different geological ages from Pre-Cambrian to Recent. As much as 60% of the State is underlain by hard rock and rest by soft rock/alluvium formations. In hard rock areas, the ground water is tapped mostly through dug wells constructed in the weathered zone. Dug cum bore wells and deep bore wells are common for irrigation. In alluvium/ soft rock areas, deep tube wells are common for both irrigation and domestic usage. The yield of open (dug) wells varies from 2 to 10 m^3/day, whereas that of tube wells ranges from less than 10 to 100 m3/day.

The assessment of groundwater resources has been carried out Taluka-wise. Total Annual Ground Water Recharge of the State has been assessed as 27.35 bcm and Annual Extractable Ground Water Resources as 25.41 bcm. The Annual Ground Water Extraction has been assessed as 13.13 bcm and Stage of Ground Water Extraction as 51.68 %.

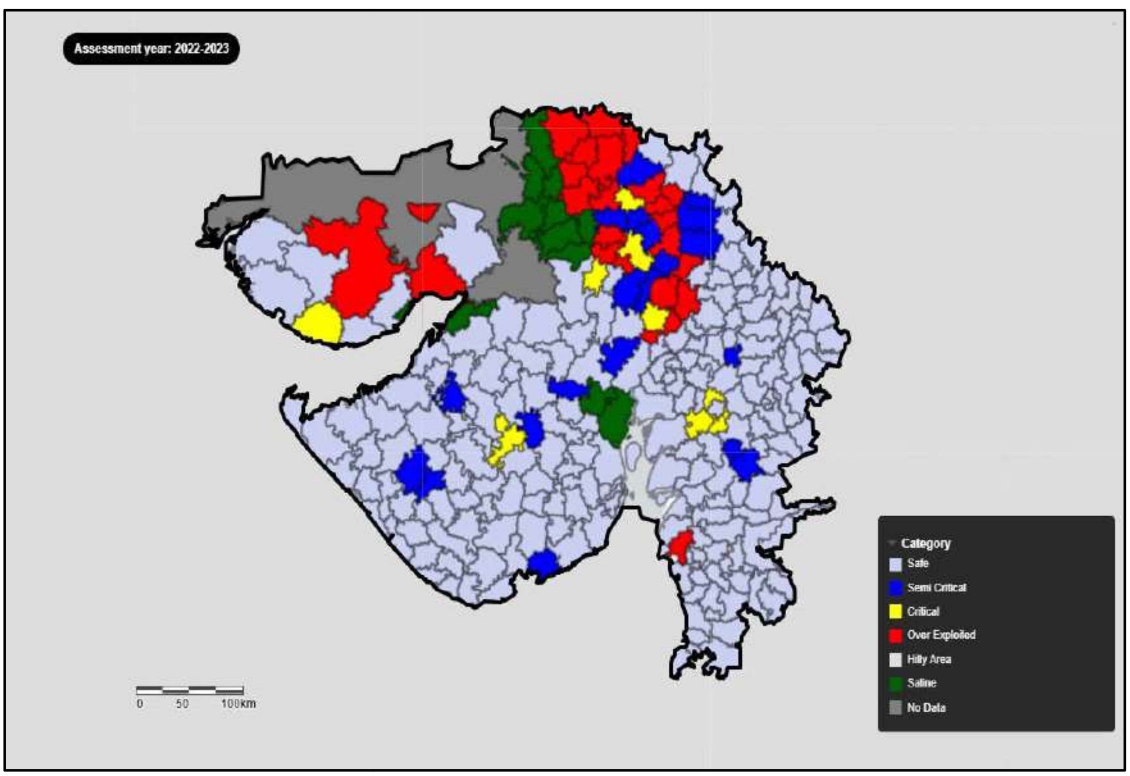
Out of 252 assessment units (talukas), 23 units (9.13 %) have been categorized as ‘Over- exploited’, 8 units (3.17 %) as ‘Critical’, 20 units (7.94 %) as ‘Semi-critical’, 189 units (75.00 %) as ‘Safe’ and there are 12 units (4.76 %) as ‘Saline’ categories of assessment units.

Similarly out of 162778.14 sq. km recharge worthy area of the State, 18448.47 sq km (11.33 %) area are under ‘Over-Exploited’, 5258.1 sq km (3.23 %) under ‘Critical’, 11487.16 sq km (7.06 %) under ‘Semi-critical’, 1,18,697.61 sq. km (72.92 %) under ‘Safe’ and 8886.8 sq. km (5.46 %) area under ‘Saline’ categories of assessment units. Out of total 25405.18 mcm annual extractable ground water resources of the State, 2105.34 mcm (8.29 %) are under ‘Over-exploited’, 743.01 mcm (2.92 %) under ‘Critical’, 2050.16 mcm (8.07 %) under ‘Semi-critical’ and 20506.66 mcm (80.72 %) are under ‘Safe’ categories of assessment units.

As compared to 2022 assessment, Total Annual Ground Water Recharge has increased from 26.46 bcm to 27.35 bcm and Annual Extractable Ground Water Resource has increased from 24.58 to 25.41 bcm. The Annual Ground Water Extraction has marginally increased from 13.09 to 13.13 bcm. The Stage of Ground Water Extraction has improved marginally from 53.23 % to 51.68 % indicating overall improvement of ground water scenario.



Dynamic Ground water Recourses Scenario 2023 – Gujarat



Categorization Map of GWRA 2023 – Gujarat

7.9 HARYANA

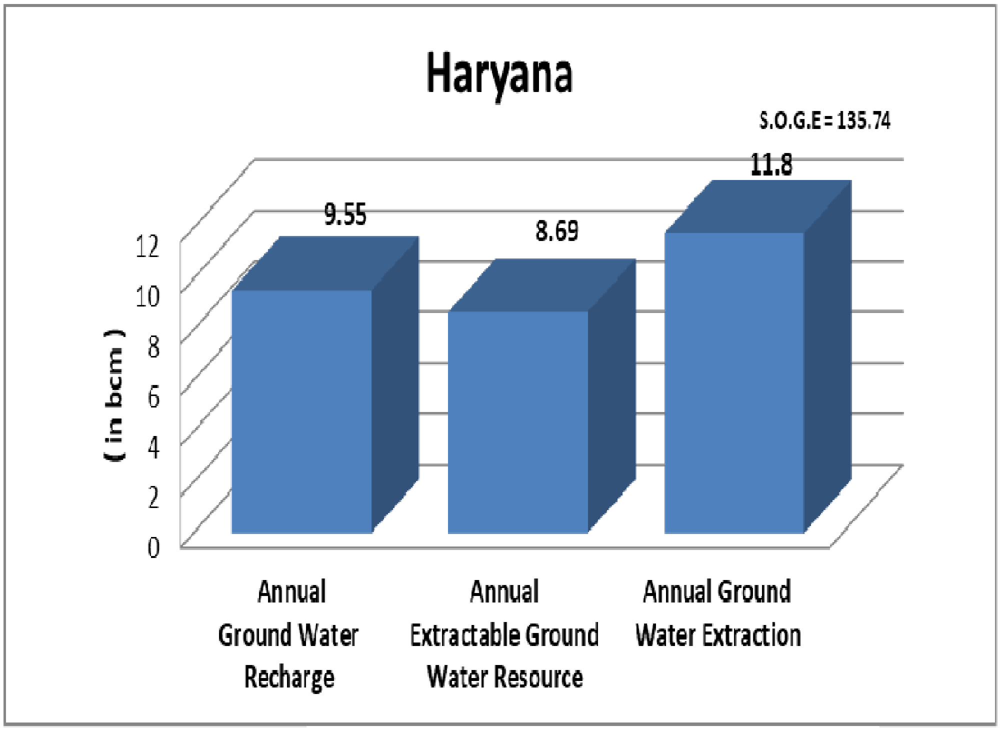
Haryana State is mainly occupied by the alluvial deposits, which cover around 98 % of the State while hardrock covers around 2 %. Alluvial deposits are of Older and Newer types and consist chiefly of clay, silt and fine to medium sand. Other deposits are piedmont deposits, which are confined to a narrow zone, about 2 to 4 km wide, between Siwalik Hills and Alluvial Plains. Sand-dunes are found in the districts of Bhiwani, Mahendragarh, Hissar and Sirsa. Coarse sand, gravels and boulders are found to occur in piedmont areas and in the adjacent alluvial tracts. The hard rock formations belong to the formation of Delhi systems of Pre- Cambrian age and occupy the southern part of the state, while Shivalik system of Tertiary age are occupying the northern most part of the state.

Total Annual Ground Water Recharge of the State has been assessed as 9.55 bcm and Annual Extractable Ground Water Resource is 8.69bcm. The Total Current Annual Ground Water extraction is 11.80bcm and Stage of Ground Water extraction is 135.74 %.

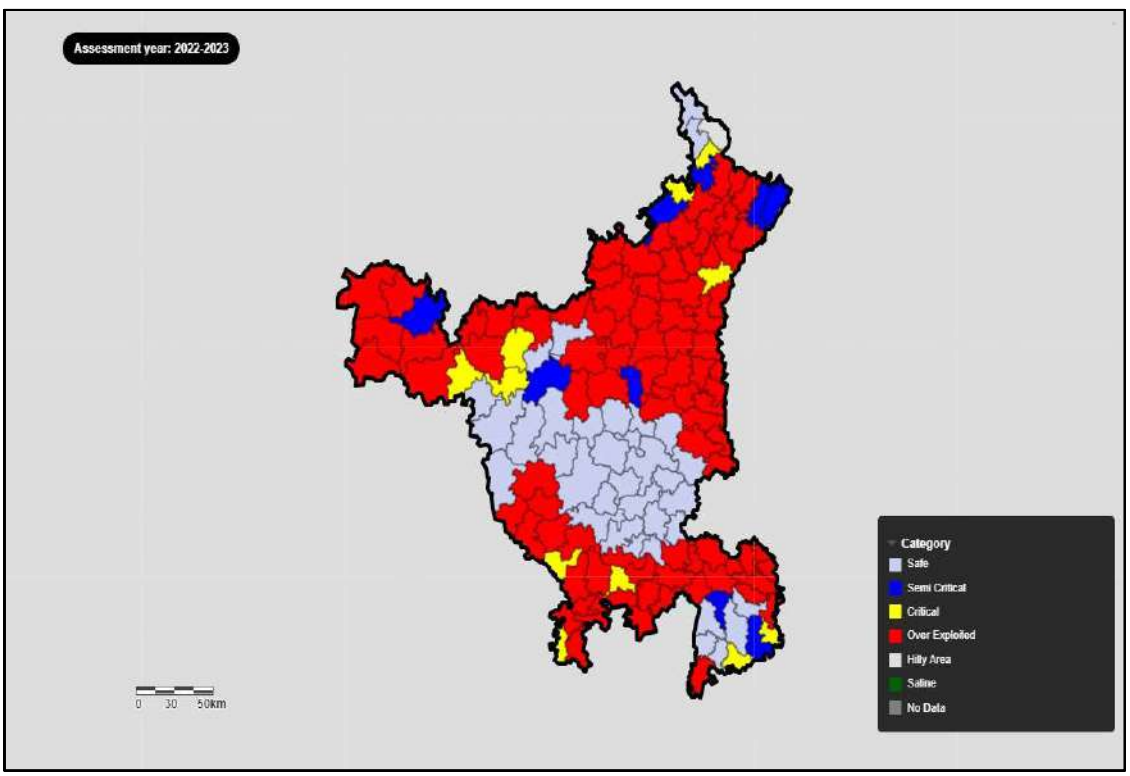
Out of total 143 assessment units (blocks/Urban), 88 units (61.54 %) have been categorized as ‘Over-exploited’, 11 units (7.69 %) as ‘Critical’, 9 units (6.29 %) as ‘Semi Critical’ and 35 units (24.48 %) as ‘Safe’ categories of assessment units.

Similarly, out of 43205.82 sq. km recharge worthy area of the State, 25959.44 sq. km (60.08 %) area are under ‘Over-Exploited’, 2590.43 sq. km (6 %) under ‘Critical’, 2558.1 sq. km (5.92%) under ‘Semi-critical’, 12097.86 sq. km (28 %) under ‘Safe’ categories of assessment units. Out of total 8690.53 mcm annual extractable ground water resources of the State, 5488.11 mcm (63.15 %) are under ‘Over-exploited’, 587.66 mcm (6.76 %) under ‘Critical’, 697.24 mcm (8.02 %) under ‘Semi-critical’ and 1917.52 mcm (22.06 %) are under ‘Safe’ categories of assessment units.

As compared to 2022 assessment, the Total Annual Ground Water Recharge have increased from 9.48 to 9.55 bcm in 2023, Annual Extractable Resources have increased from 8.61 to 8.69 bcm and the Annual Ground Water Extraction from 11.54 to 11.80 bcm. The Stage of Ground Water Extraction has increased from 134.14 % to 135.74 %.



Dynamic Ground water Recourses Scenario 2023 – Haryana



Categorization Map of GWRA 2023 – Haryana

7.10 HIMACHAL PRADESH

The diverse physiographic, climatic, topographic and geologic conditions have given rise to diversified groundwater situation in different parts of the state. The rock formations ranging in age from Archean to Recent occupy the State and control the occurrence and movement of ground water depending upon aquifer composition, structure and deposition. Hilly and mountainous parts with steep slopes mainly constitute the run off areas and have low ground water potential. In valley and low-lying areas, unconsolidated / semi-consolidated formations form potential aquifers.

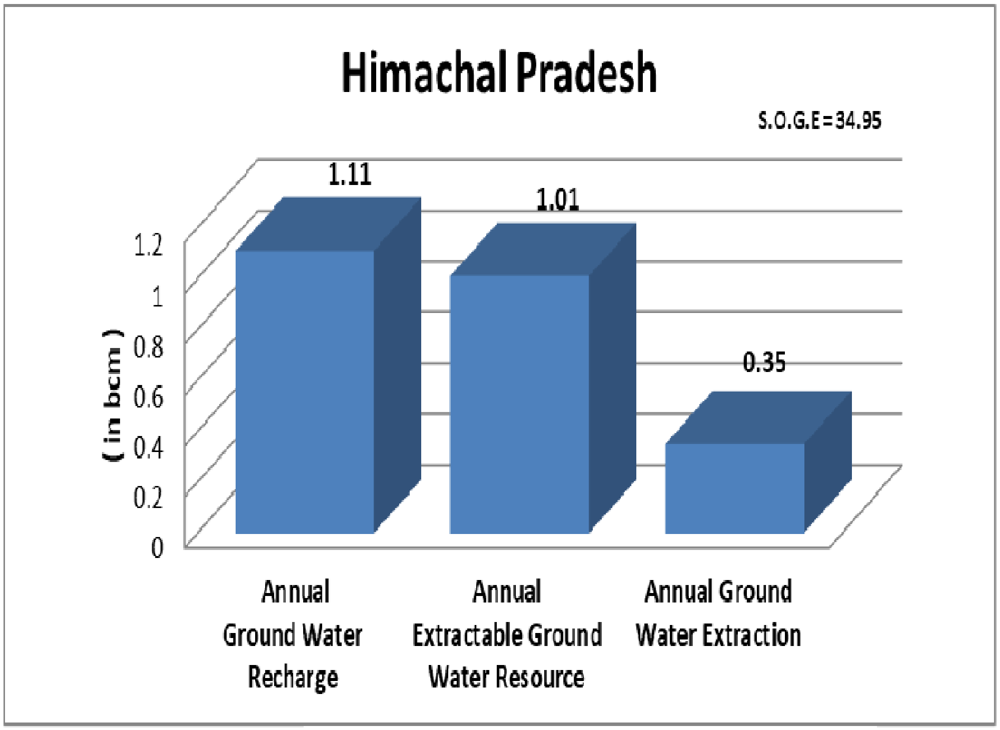
In consolidated formations the water availability is restricted to weathered mantle, joints/fractures, weak planes, bedding planes and limestone caverns. The limestone associated with phyllite and quartzite forms potential aquifers. In granites, potentiality of the aquifer is highly dependable on the fracture intensity. In granitic aquifers the discharge ranges between 1-3 lps. Groundwater in hard rock areas is either developed though bore wells or natural springs are tapped for both drinking and irrigation purposes.

In the unconsolidated formations the occurrence and movement of ground water is highly dependent on lithology particularly the presence of clay content. The unconsolidated formations are confined to valley areas, having good yield prospects that can sustain moderate to high capacity deep tube wells. The yield of the tube wells depends on the thickness of the total granular zones available within the aquifers tapped which ranges from 5-40 lps in different valleys. The Ground water resources have been assessed valley-wise.

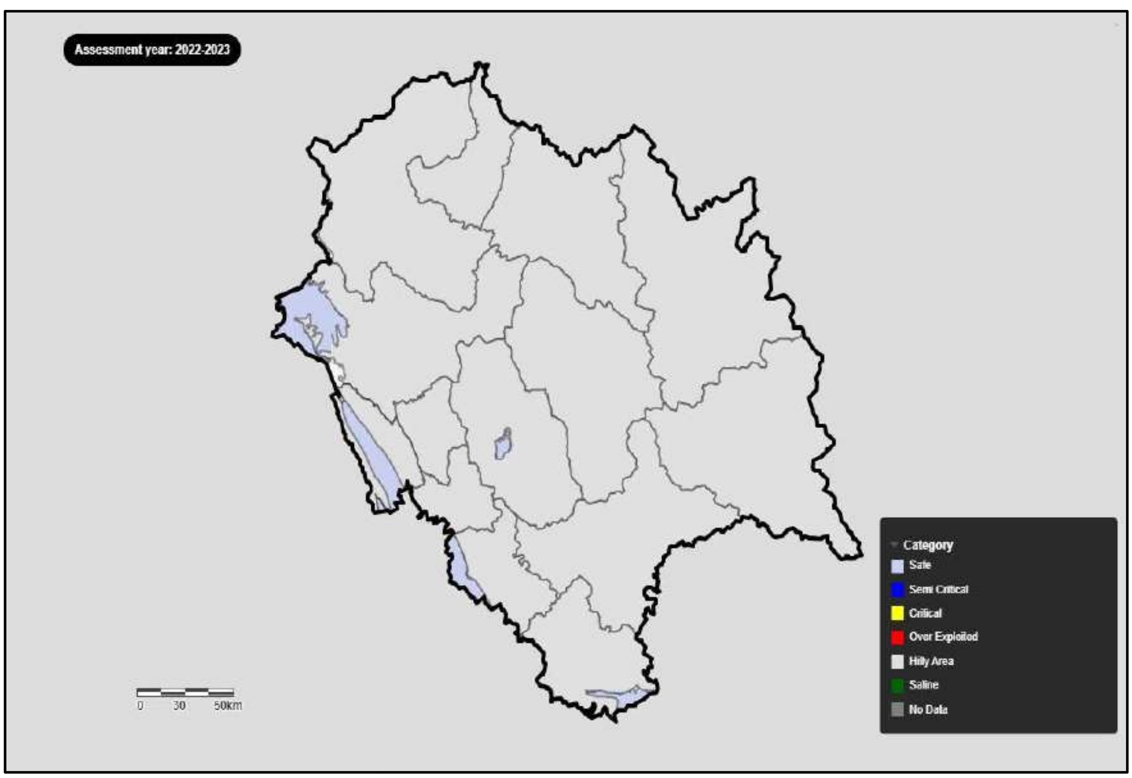
Total Annual Ground Water Recharge of the State has been assessed as 1.11 bcm and Annual Extractable Groundwater Resources is 1.01 bcm. The Current Annual Ground Water Extraction for all uses is 0.35 bcm and Stage of Ground Water Extraction is 34.95 %. Out of the 10 assessment units, all the ten assessment units have been categorized as 'Safe' and there is no saline assessment unit in the State.

Similarly, out of 3468 sq. km recharge worthy area of the State, 100 % under 'Safe' categories of assessment units. Out of total 1014.53 mcm annual extractable ground water resources of the State, 1014.53 mcm (100 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, there is increase in the Total Annual Ground Water Recharge from 1.03 to 1.11 bcm and Annual Extractable Ground Water resources from 0.94 to 1.01 bcm. However, there is no change in Ground Water Extraction of the State. The Stage of Ground Water Extraction has decreased from 37.56 % to 34.95 %.



Dynamic Ground water Recourses Scenario 2023 – Himachal Pradesh



Categorization Map of GWRA 2023 – Himachal Pradesh

7.11 JHARKHAND

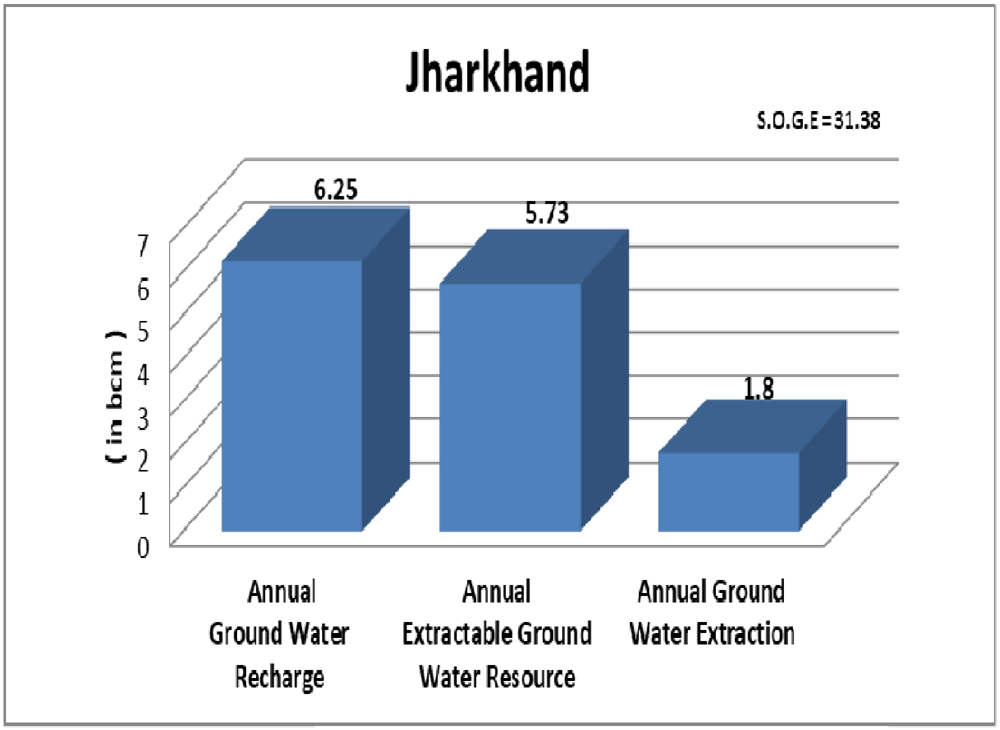
The State is underlain by diverse rock types of different geological ages ranging from Archaean to Recent. The major rock types are igneous and metamorphic rocks covering nearly 85 percent of the geographical area of the state. The weathered zone ranging between 10-30 m acts as a good repository of ground water. However, the secondary porosities in the form of fracture zones below the weathered zones also form potential aquifers. The yield of the exploratory wells ranges from upto 151 m^3/hr. The yield of the dugwells ranges from 0.5 to 0.75 m^3/hr. The dug wells tapping the weathered zone have an average yield of 0.5 to 1.2 m^3/hr. In Gondwana Super group, bore well discharge ranges between 7 to 15 m^3/hr and in Tertiary formations, yield ranges from 18 to 78 m^3/hr. The Younger Alluvium deposits are confined to patches. The depth of dug wells in general ranges between 10 to 15m bgl and that of shallow tube wells varies between 25 to 50 mbgl.

Ground Water Resource of the State has been assessed block-wise and identified urban area. The Total Annual Ground Water Recharge of the State has been assessed as 6.25 bcm and Annual Extractable Ground Water Resources is 5.73 bcm. The Annual Ground Water Extraction is 1.8 bcm and Stage of Extraction is 31.38 %.

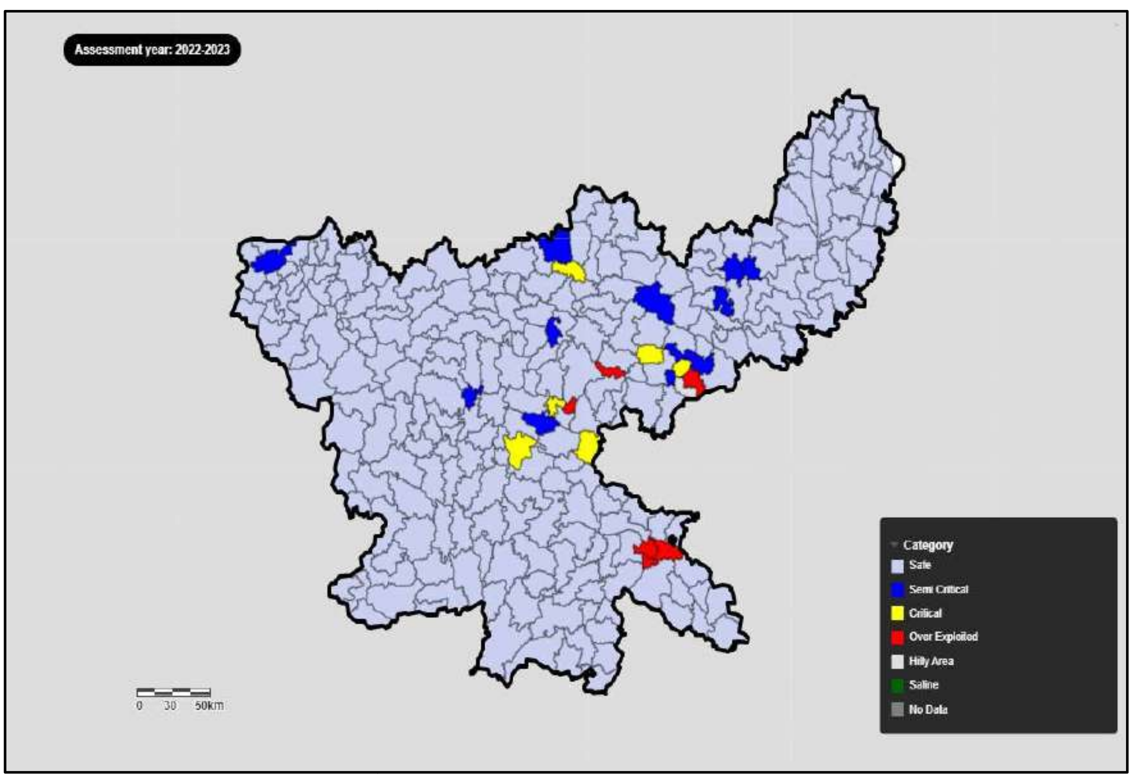
Out of 263 assessment units (blocks-259, Urban area-04), 5 units (1.90 %) have been categorized as 'Over-exploited', 6 units (2.28 %) as 'Critical', 11 units (4.18 %) as 'Semi-critical' and rest 241 units (91.63 %) are under 'Safe' category and there is no saline assessment unit in the State.

Similarly, out of 60646.73 sq km recharge worthy area of the State, 463.92 sq km (0.76 %) area are under 'Over-Exploited', 1068.48 sq km (1.76 %) under 'Critical', 2169.13 sq km (3.58 %) under 'Semi-critical' and 56945.20 sq km (93.90 %) under 'Safe' categories of assessment units. Out of total 5730.94 mcm annual extractable ground water resources of the State, 61.08 mcm (1.07%) are under 'Over-exploited', 133.06 mcm (2.32%) under 'Critical', 221.95 mcm (3.87%) under 'Semi-critical' and 5314.85 mcm (92.74%) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, Total Annual Ground Water Recharge and Annual Extractable Ground Water Resources have increased from 6.21 to 6.25 bcm and 5.69 to 5.73 bcm respectively. The Annual Ground Water Extraction for the State has increased from 1.78 to 1.8 bcm and the Stage of Ground Water Extraction has increased from 31.35 % to 31.38%.



Dynamic Ground water Recourses Scenario 2023 - Jharkhamd



Categorization Map of GWRA 2023 – Jharkhand

7.12 KARNATAKA

Karnataka State is underlain by rock types ranging in age from Archaean to Recent. Major portion of the State is covered by Peninsular Gneisses, Granites and Dharwar Schists of Archaean age. Substantial area in the northern part of Karnataka is underlain by basalts, which form a continuation of the Deccan Traps occurring in Maharashtra. The sedimentary formations comprising Bhima and Kaladgis occupy a small area in the northern districts. The recent alluvium is restricted to a narrow belt in the coastal area and along stream courses.

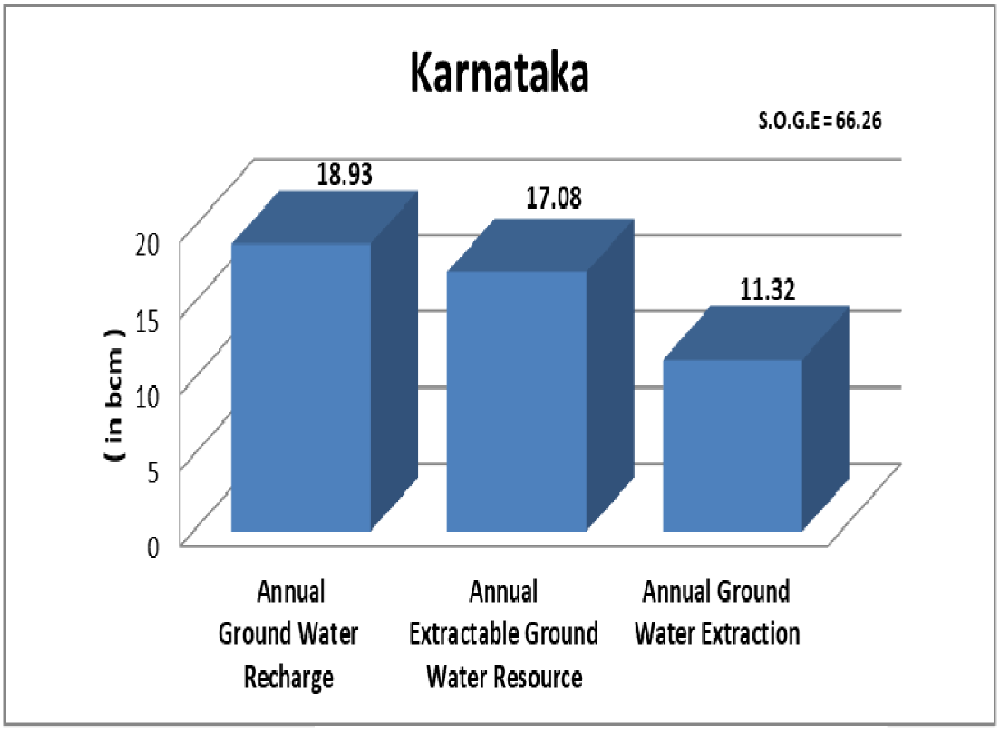
The aquifer systems are classified into nine major groups depending upon their characteristics and are Banded Gneissic Complex (BGC), Basalt, Schists, Granites, Charnockites, Limestones, Laterites, Sandstones and Alluvium.

Ground Water Resource of the State has been assessed taluk-wise The Annual Ground Water Recharge has been assessed as 18.93 bcm and the Annual Extractable Ground Water resource is 17.08 bcm. The present Annual Ground Water Extraction is 11.32 bcm and the Stage of Ground Water Extraction is 66.26%.

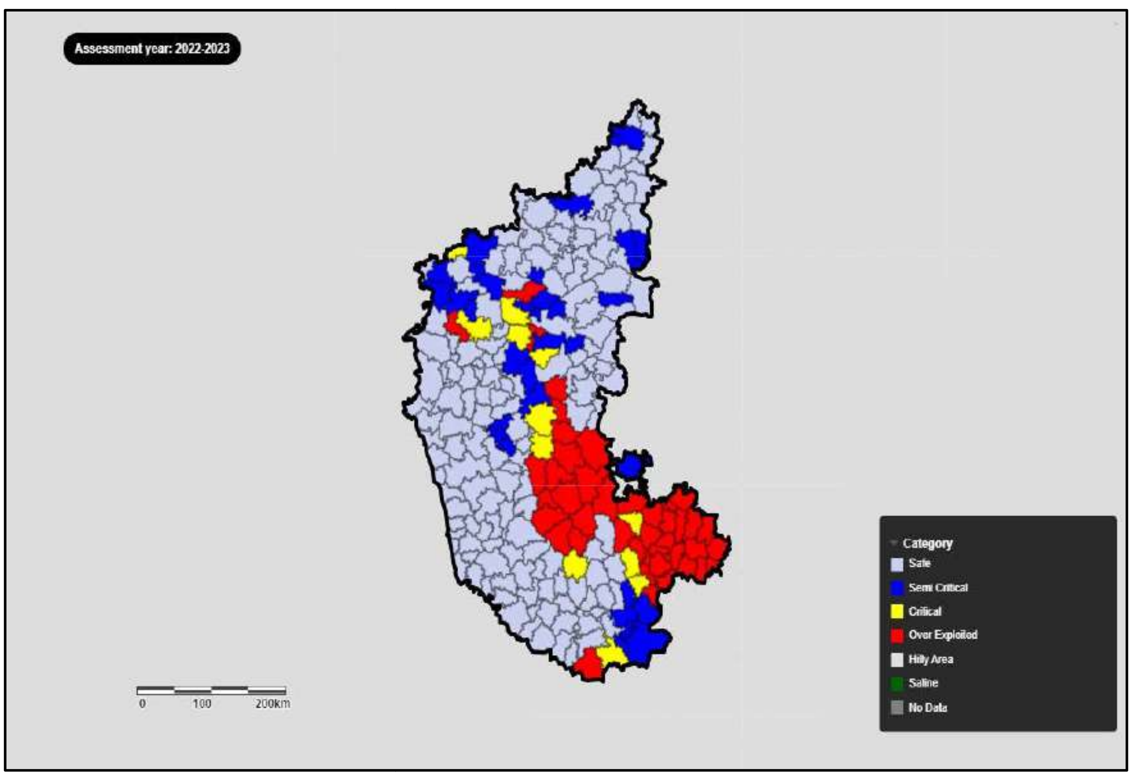
Out of the 234 assessment units (taluks), 44 units (18.8 %) have been categorized as 'Over exploited', 12 units (5.13 %) as 'Critical', and 32 units (13.68 %) as 'Semi critical' and 146 units (62.39 %) have been categorized as 'Safe'. There is no taluk under "Saline" category.

Similarly, out of 170463.35 sq km recharge worthy area of the State, 34281.35 sq km (20.11%) area are under 'Over-Exploited', 10443.17 sq km (6.13 %) under 'Critical', 22695.74 sq km (13.31 %) under 'Semi-critical' and 103043.09 sq km (60.45%) under 'Safe' categories of assessment units. Out of total 17080.79 mcm annual extractable ground water resources of the State, 2721.54 mcm (15.93 %) are under 'Over-exploited', 948.56 mcm (5.55%) under 'Critical', 2245.55 mcm (13.15%) under 'Semi-critical' and 11165.14 mcm (65.37%) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, there is increase in Annual Ground Water Recharge from 17.74 bcm to 18.93 bcm, Annual Extractable Ground Water Resources from 16.04 bcm to 17.08 bcm. This is mainly due to increase in rainfall recharge, recharge from surface water irrigation, recharge from water conservation structures and recharge from tanks and ponds. There is marginal increase in the Current Annual Ground Water Extraction for all uses from 11.22 to 11.32 bcm during this period. Hence overall, the Stage of Ground Water Extraction has decreased from 69.93% in 2022 to 66.26 % in 2023 indicating improvement in overall ground water scenario .As compared to 2022, 17 assessment units (taluks) have improved mainly due to increase in rainfall recharge and recharge from other sources, whereas 1 assessment unit has deteriorated due to reduction in rainfall recharge and slight increase in draft. The ground water quality tagging has also been done, wherein 17 taluks has been tagged for salinity and 14 taluks for fluoride.



Dynamic Ground water Recourses Scenario 2023 – Karnataka



Categorization Map of GWRA 2023 – Karnataka

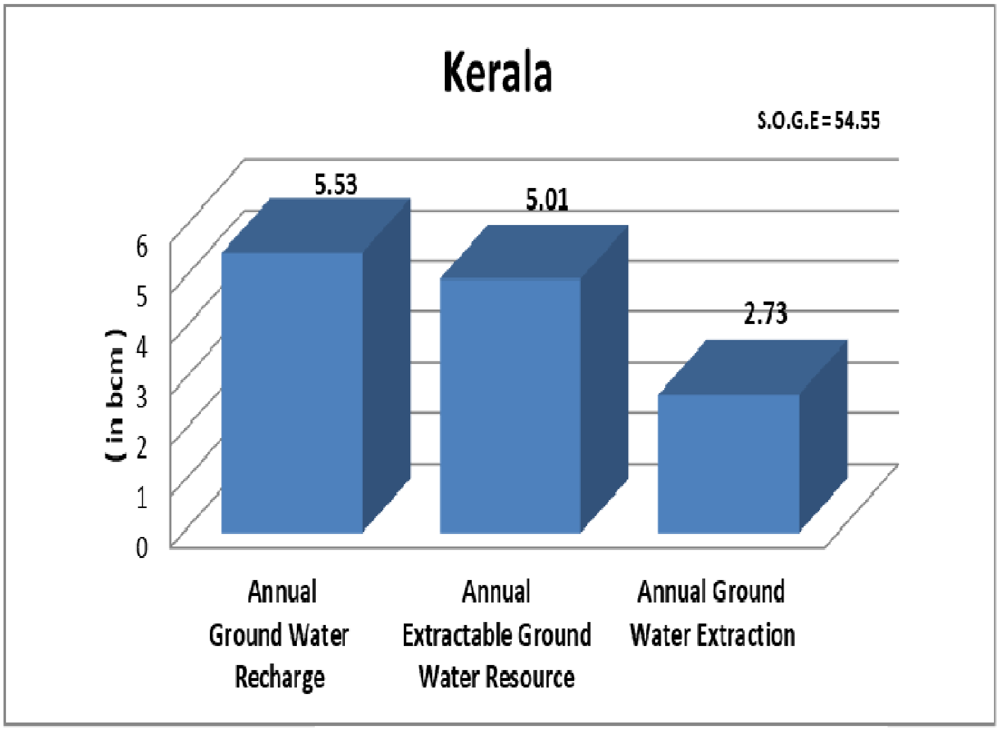
7.13 KERALA

The State of Kerala is underlain by diverse rock types of different geological ages from Pre- Cambrian to Recent. Nearly, 88% of the State is underlain by crystalline rocks of Archaean age comprising Schistose formations, Charnockites, Khondalites and Gneisses. All these formations are intruded by dykes of younger age. The sedimentary formations of Tertiary age occurring along the western parts of the State comprise four distinct beds viz. Alleppey, Vaikom, Quilon and Warkali. The crystalline and the Tertiary formations are lateritized along the midland area. Yields of open (dug) wells in these areas vary from 0.02 to 0.12 lps, whereas that of bore wells ranges from less than 1 to 35 lps. About 12% of the State is underlain by Semi-consolidated and unconsolidated sedimentary formations where dug wells and filter points have yields of 0.02 to 0.4 lps, whereas deep tube wells have yields in the range of 1 to 57 lps. Laterites, which cover most of the geological formations in the major part of the state also forms an important aquifer in the state with dug wells having yields in the range of 0.005 to 0.069 lps.

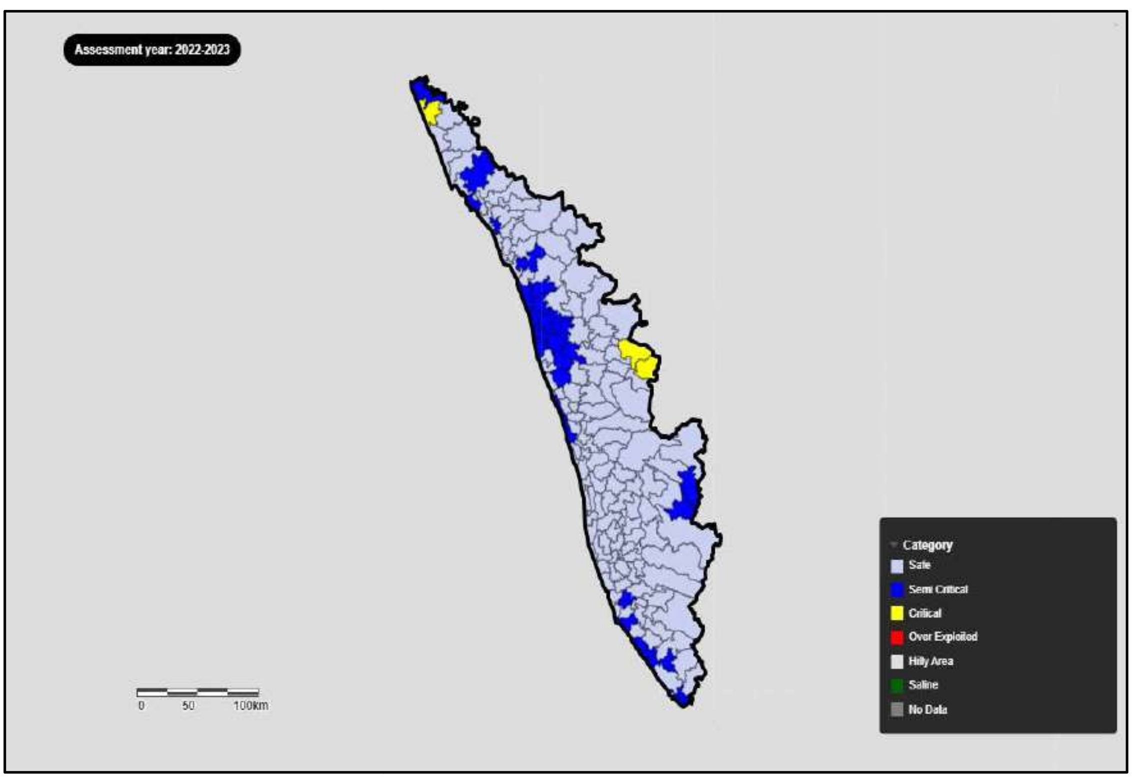
The ground water resources for the state have been assessed block-wise. Total Annual Ground Water Recharge has been estimated as 5.53bcm and Annual Extractable Ground Water Resource is 5.01 bcm. The Annual Ground Water Extraction is 2.73 bcm and Stage of Ground Water Extraction is 54.55 %.

Out of total 152 assessment units (blocks), 3 units (1.97 %) have been categorized as ‘Critical’, 30 units (19.74 %) as ‘Semi-Critical’ and 119 units (78.29 %) as ‘Safe’ categories of assessment units. There is no ‘Over- exploited’ and ‘Saline’ assessment unit in the State. Similarly, out of 27047.53 sq km recharge worthy area of the State, 777.38 sq km (2.87 %) area are under ‘Critical’, 4211.15 sq km (15.57 %) under ‘Semi-critical’ and 22059.01 sq km (81.56 %) area are under ‘Safe’ categories of assessment units. Out of total 5005.27 mcm annual extractable ground water resources of the State, 136.74 mcm (2.73 %) are under ‘Critical’, 761.3 mcm (15.21%) under ‘Semi-critical’ and 4107.22 mcm (82.06 %) are under ‘Safe’ categories of assessment units.

As compared to 2022 assessment, Total Annual Ground Water Recharge of the State has decreased from 5.74 to 5.53bcm and Annual Extractable Ground Water Resources from 5.19 to 5.01bcm. The annual ground water extraction has consistently remained at 2.73 bcm, with no notable change from the previous 2.73 bcm.and the Stage of Ground Water Extraction has increased from 52.56 % to 54.55 %.. Three blocks have deteriorated its category from Safe to Semi-critical viz. Kozhikode (Kozhikode district), Sasthamcotta (Kollam district) and Varkala (Thiruvananthapuram district).



Dynamic Ground water Recourses Scenario 2023 – Kerala



Categorization Map of GWRA 2023 – Kerala

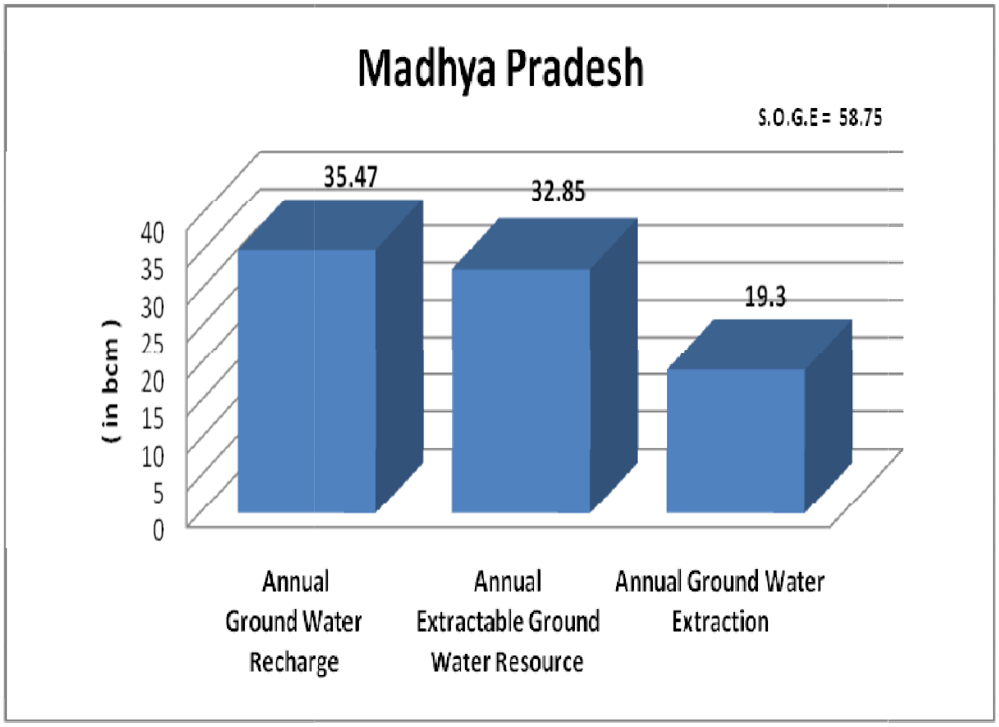
7.14 MADHYA PRADESH

The State of Madhya Pradesh has varied hydrogeological characteristics due to which ground water potential differs from place to place. The State is underlain by various Geological formations ranging in age from the Archaean to the Recent. Hard rock areas cover more than 80% of total land area of the State. These hard-rock areas show wide variations and complexities in nature and composition of rocks, geological structures, geomorphological set up and hydro meteorological conditions. The crystalline rocks of Archaean age like granite, gneiss, granulites, schist, quartzite and granitoids occupy about 15% of geographical area of the State. The basaltic rocks of Deccan lava flows are the predominant formations and occupy nearly 45% of total geographical area. The consolidated sedimentary rocks of Vindhyan Super Group and Mahakoshal (Cuddapah) Super Group of Proterozoic age occupy about 19% of total geographical area and the semi consolidated (Gondwana Formation) occupies about 7%. Recent unconsolidated alluvial sediments occupy about 14% of total geographical area.

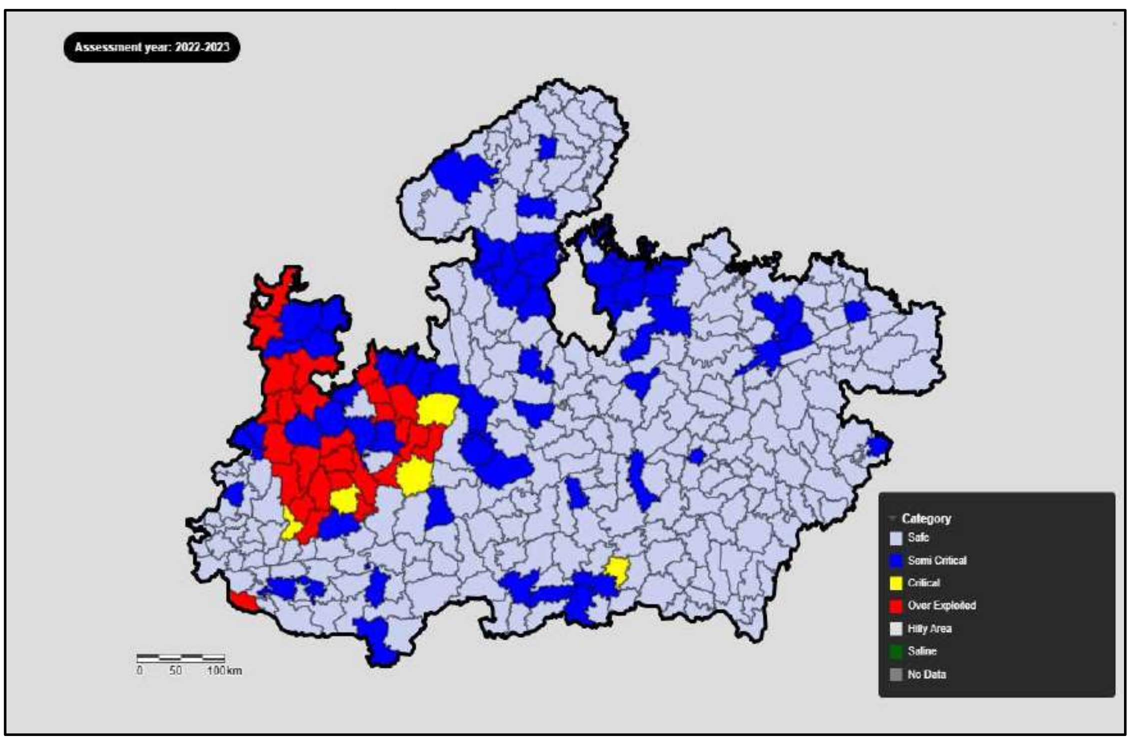
Total Annual Ground Water Recharge of the State has been assessed as 35.47 bcm and Annual Extractable Ground Water Resources is 32.85 bcm. The Annual Ground Water Extraction is 19.30 bcm and Stage of Ground Water Extraction is 58.75 %.

Out of 317 assessment units (313 blocks and 4 urban areas), 26 units (8.2 %) has been categorized as 'Over Exploited', 5 units (1.58 %) as 'Critical', 60 units (18.93 %) as 'Semi-Critical' and 226 units (71.29 %) as 'Safe' categories of assessment units and there are no saline assessment unit. Similarly, out of 269333.27 sq km recharge worthy area of the State, 22554.86 sq km (8.37%) area is under 'Over-Exploited', 4249.07 sq km (1.58 %) under 'Critical', 51803.76 sq km (19.23 %) under 'Semi-critical' and 190725.58 sq km (70.81 %) under 'Safe' categories of assessment units. Out of total 32853.75 mcm annual extractable ground water resources of the State, 3424.26 mcm (10.42%) are under 'Over-exploited', 537.1 mcm (1.63 %) under 'Critical', 6119.62 mcm (18.63 %) under 'Semi-critical' and 22772.77 mcm (69.32%) are under 'Safe' categories of assessment units.

In the assessment year 2023, there has been a shift in the dynamics of groundwater resources compared to the 2022 assessment. Notably, there has been an increase in both groundwater recharge and groundwater extraction. The rise in groundwater recharge can be attributed to increased rainfall recharge and the implementation of water conservation structures, Simultaneously, a discernible escalation in groundwater extraction has transpired, propelled by the recalibration of well census data, escalating water demands due to burgeoning population growth. Total Annual Ground Water Recharge of the State has increase from 35.23 bcm to 35.47 bcm and Annual Extractable Ground Water Resources from 32.58 to 32.85 bcm. The Annual Ground Water Extraction has increased from 19.25 to 19.3 bcm and the Stage of Ground Water Extraction has decreased from 59.1 % to 58.75 %.



Dynamic Ground water Recourses Scenario 2023 – Madhya Pardesh



Categorization Map of GWRA 2023 – Madhya Pradesh

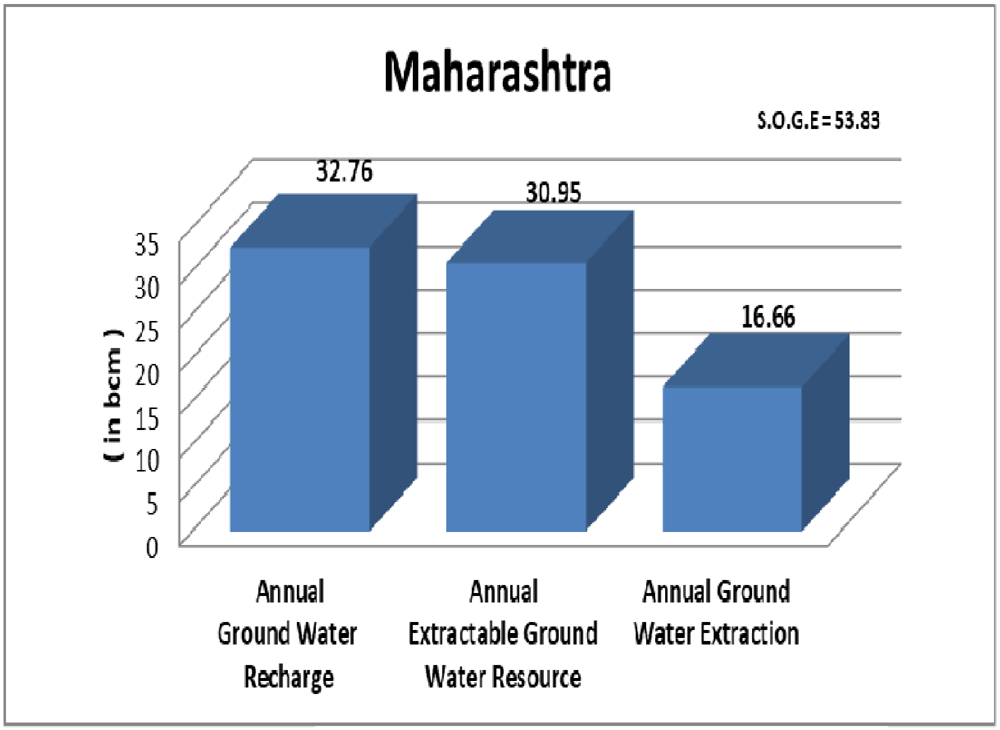
7.15 MAHARASTRA

The State is underlain by diverse rock types of different geological ages from Pre-Cambrian to Recent. The state is mostly covered by Deccan Traps. The other geological formations, older and younger than Deccan Traps, occur in the northeast and as isolated patches in the Sindhudurg and Ratnagiri districts. Large part of the State is underlain by Basaltic hard rock's where dug wells are predominant. They mostly tap the weathered zone and fractures/joints. The yield of dug wells varies from 3 to 5 lps. A small part of the State is occupied by Semi- consolidated sedimentary rocks where tube wells have a yield of 5 to 45 lps. The central part of Maharashtra which is a drought prone area, receives very less rainfall i.e. from 400 to 700 mm, but the geology is favorable for the ground water recharge. Hence, in this area the dependency on groundwater is very high. Two-third of irrigation wells are from this area only. This primarily includes parts from Dhule, Nashik, Jalgaon, Ahmednagar, Pune, Satara, Sangli, Solapur, Osmanabad, Beed and Aurangabad districts.

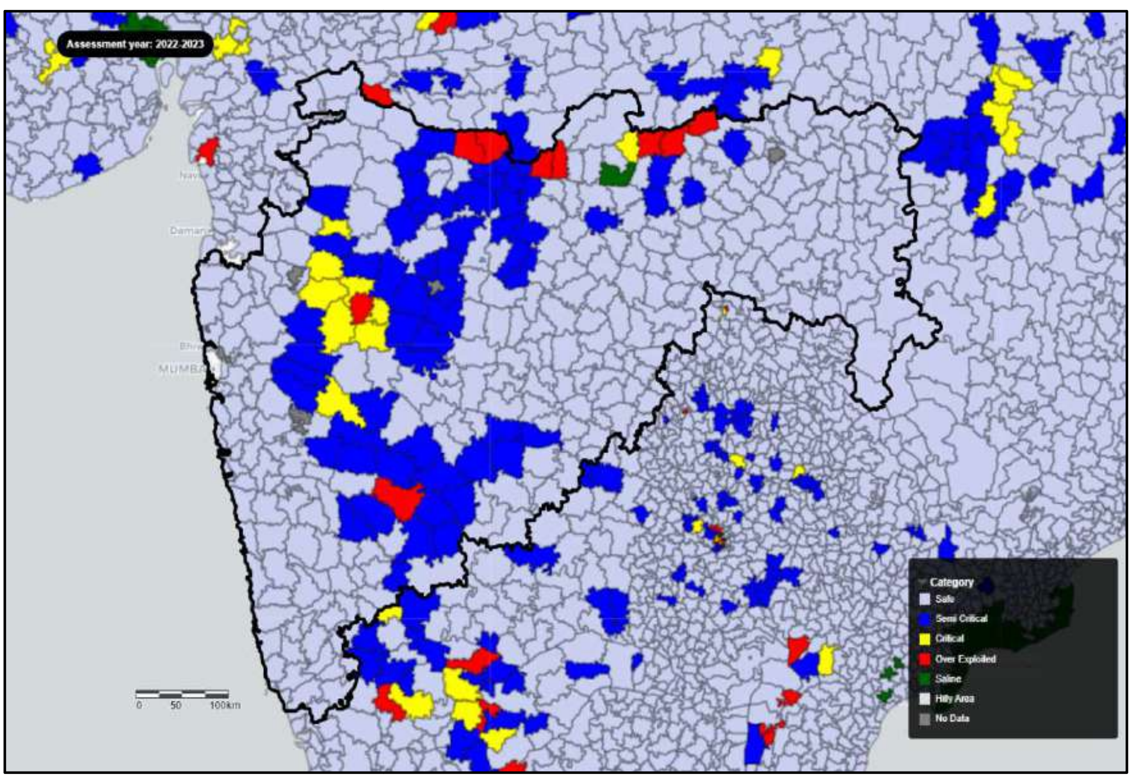
The Ground water resources have been assessed for 1534 watersheds in the state and subsequently apportioned to taluk level. Total Annual Ground Water Recharge of the State has been estimated as 32.76 bcm and Annual Extractable Ground Water Resources is 30.95 bcm. The Annual Ground Water Extraction is 16.66 bcm and Stage of Ground Water Extraction is 53.83 %.

Out of 353 assessment units (taluks), 9 units (2.55%) have been categorized as 'Over-exploited', 9 units (2.55 %) as 'Critical', 57 units (16.15 %) as 'Semi-critical' and remaining 277 units (78.47 %) as 'Safe' and 1 unit (0.28 %) as 'Saline' categories of assessment units. Similarly, out of 259914.03 sq. km recharge worthy area of the State, 7034.69 sq. km (2.71 %) area is under 'Over-Exploited', 8857.49 sq. km (3.41 %) under 'Critical', 56959.42 sq. km (21.91 %) under 'Semi-critical', 186285.52 sq. km (71.67 %) under 'Safe' and 776.89 sq. km (0.30 %) area under 'Saline' categories of assessment units. Out of total 30949.23 mcm annual extractable ground water resources of the State, 816.52 mcm (2.64 %) are under 'Over-exploited', 1037.96 mcm (3.35 %) under 'Critical', 6283.84 mcm (20.3 %) under 'Semi-critical' and 22810.91 mcm (73.7 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, the Annual Ground Water Recharge and annual extractable ground water resources in 2023 has increased marginally from 32.29 bcm to 32.76 bcm and 30.45 to 30.95 bcm and Annual Ground Water Extraction remain more or less same. The Stage of Ground Water Extraction has decreased marginally from 54.68 % to 53.83%.



Dynamic Ground water Recourses Scenario 2023 – Maharashtra



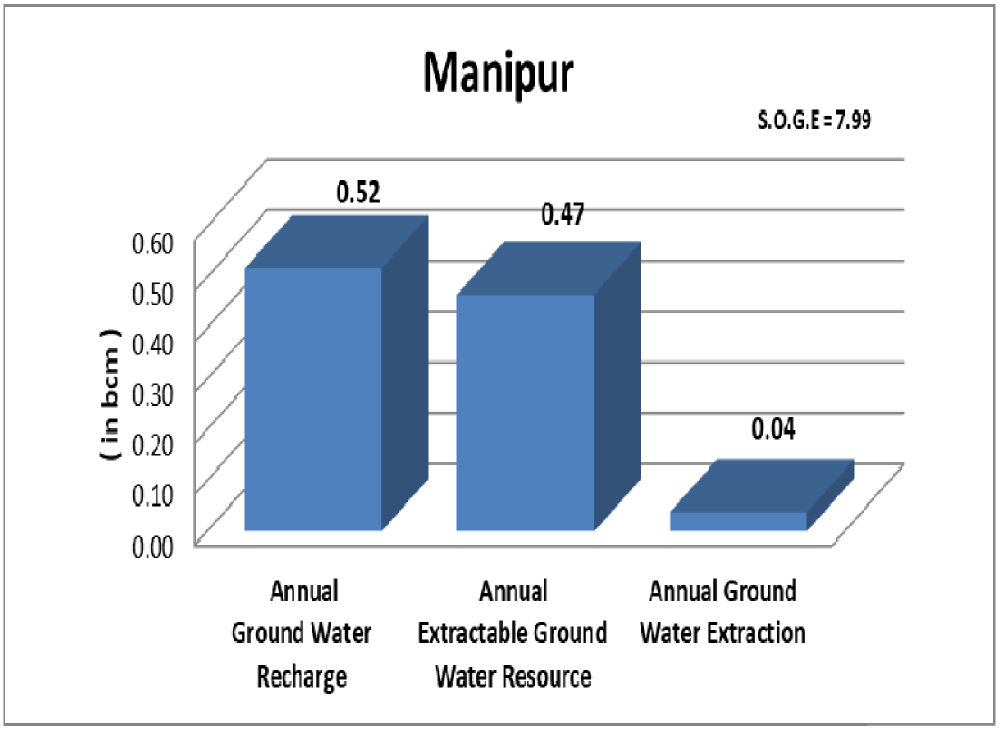
Categorization Map of GWRA 2023 – Maharashtra

7.16 MANIPUR

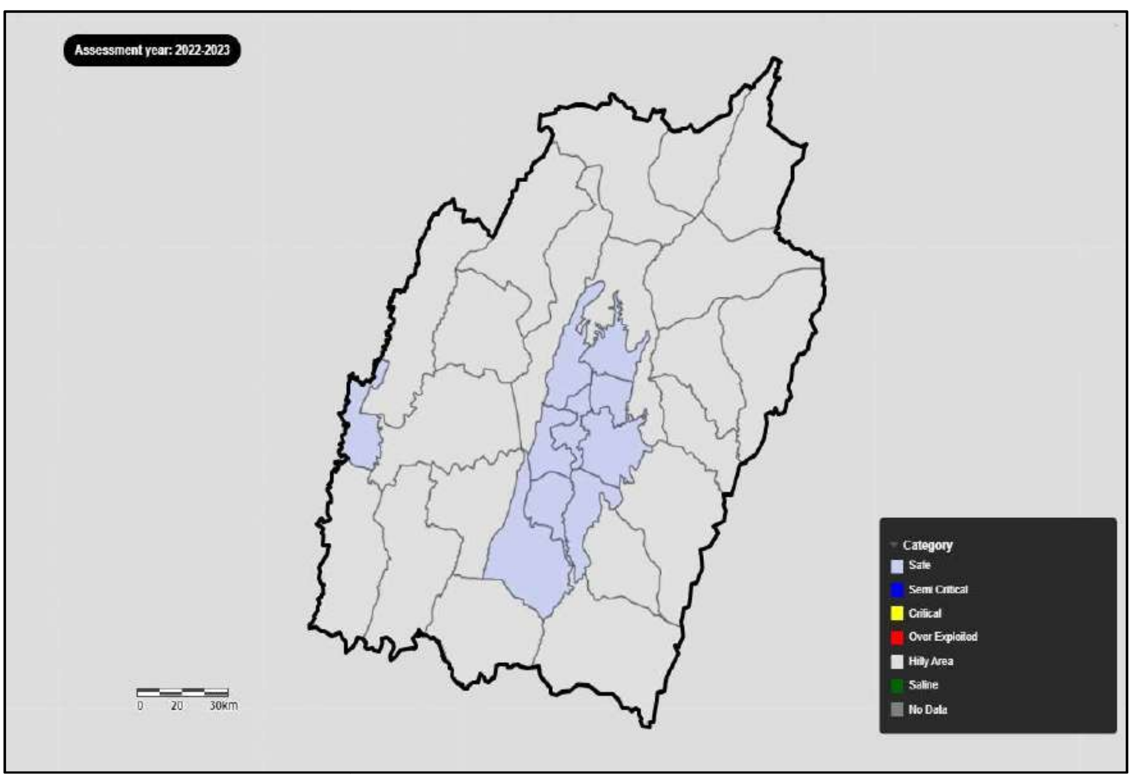
The State of Manipur is occupied by mostly North South parallel hill ranges made up of consolidated and semi-consolidated rocks ranging in age from pre-Mesozoic to Miocene. The consolidated rocks confined to the eastern part of the state along the Myanmar border. The semi-consolidated formations, which cover almost the entire state, comprise shale, siltstone, sandstone, and conglomerate. These formations belong to Disang, Barail, Surma and Tipam group of rocks. In the western and central part of the State, unconsolidated alluvium of quaternary age occurs in the valleys and topographical lows. Ground water is restricted to secondary porosity in joints, fissures, fractures and weathered residuum of consolidated and semi-consolidated rocks and inter-granular pore spaces of alluvial deposits. In the valley, ground water is utilized through tube wells, tapping granular zones with 10 to 20 m thickness, and the yield of the tube well varies from 10 to 30 m3/hr.

The Ground Water Resources of Manipur as in 2023 have been assessed block-wise for the recharge worthy area. Total Annual Ground Water Recharge of the State has been assessed as 0.52 bcm and Annual Extractable Ground Water Resources as 0.47 bcm. The Annual Ground Water Extraction is 0.04 bcm and Stage of Ground Water extraction is 7.99 %. All the assessment units and districts have been categorized as 'Safe' and there is no saline area in the state. Out of 9 assessment units 9 units (100 %) as 'Safe' categories of assessment units and there is no saline assessment unit.

Similarly, out of 2559 sq km recharge worthy area of the State, 2559 sq km (100 %) under 'Safe' categories of assessment units. Out of total 466.07 mcm annual extractable ground water resources of the State, 466.07 mcm (100 %) are under 'Safe' categories of assessment units. The comparison with previous assessment shows there is no major changes in the Ground Water Resources of Manipur.



Dynamic Ground water Recourses Scenario 2023 – Manipur



Categorization Map of GWRA 2023 – Manipur

7.17 MEGHALAYA

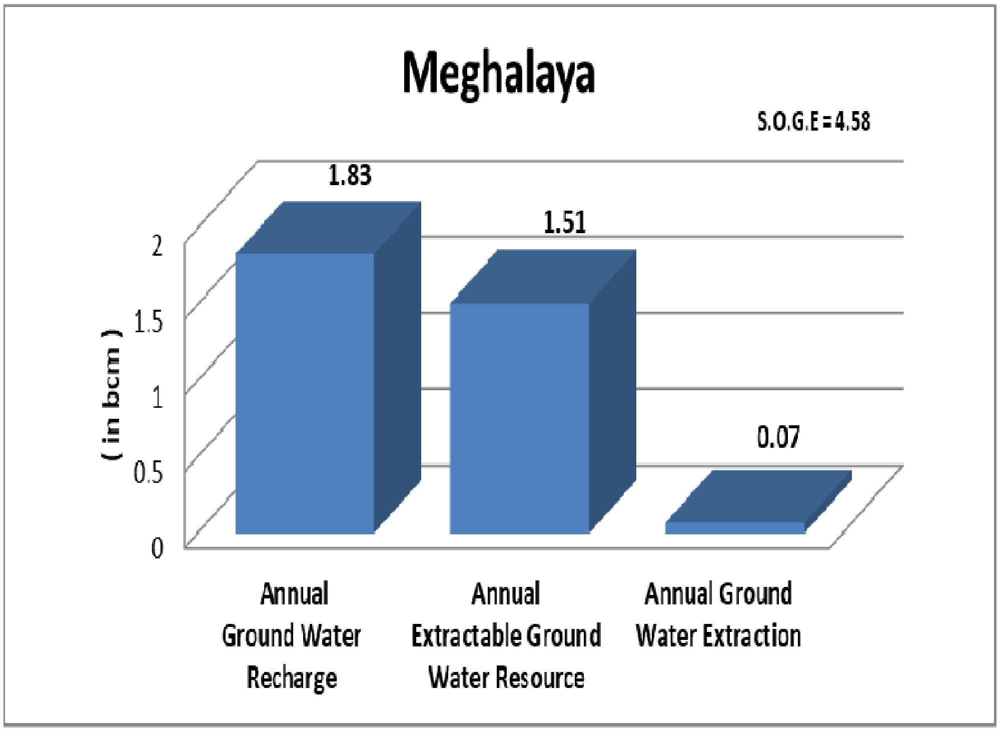
The Meghalaya State is essentially occupied by hard rocks belonging to the Archean gneissic complex with acidic and basic intrusives and Precambrian Shillong Group of rocks. The aquifer system in the state can be divided as a two aquifer systems, viz., first aquifer (shallow) and second aquifer (deeper). Shallow or first aquifer consists of weathered residuum where ground water occurs under water table condition and is mainly developed through construction of dug wells. The second aquifer is the deeper aquifer which tapped the fractured zone and is mainly developed through borewells. Based on the study of litholog and analysis of depth of construction of dug wells and bore wells, it is found that the first aquifer occur within depth of 20 to 40 m. Ground water in the second aquifer occurs under semi-confined to confined condition in the fractures upto the maximum explored depth of 280m. The south-western, southern and south-eastern parts of the state is covered by semi- consolidated formations comprising sandstones, shales, conglomerates, limestones etc. belonging to Cretaceous – Tertiary age. The aquifers are formed by rock strata that are granular/porous, fissured/fractured or cavernous. These aquifers are thick and discontinuous in nature. The unconsolidated sediments comprising sand, gravel, silt, clay, etc. are found to occur as thin veneer along rivulets and as valley-fills.

The Ground water resources have been assessed block-wise. Total Annual Ground Water Recharge of the State has been assessed as 1.83 bcm and Annual Extractable Ground Water Resources as 1.51 bcm. The Annual Ground Water Extraction is 0.07 bcm and Stage of Ground Water Extraction is 4.58 %. All the 39 assessment units have been categorized as ‘Safe’.

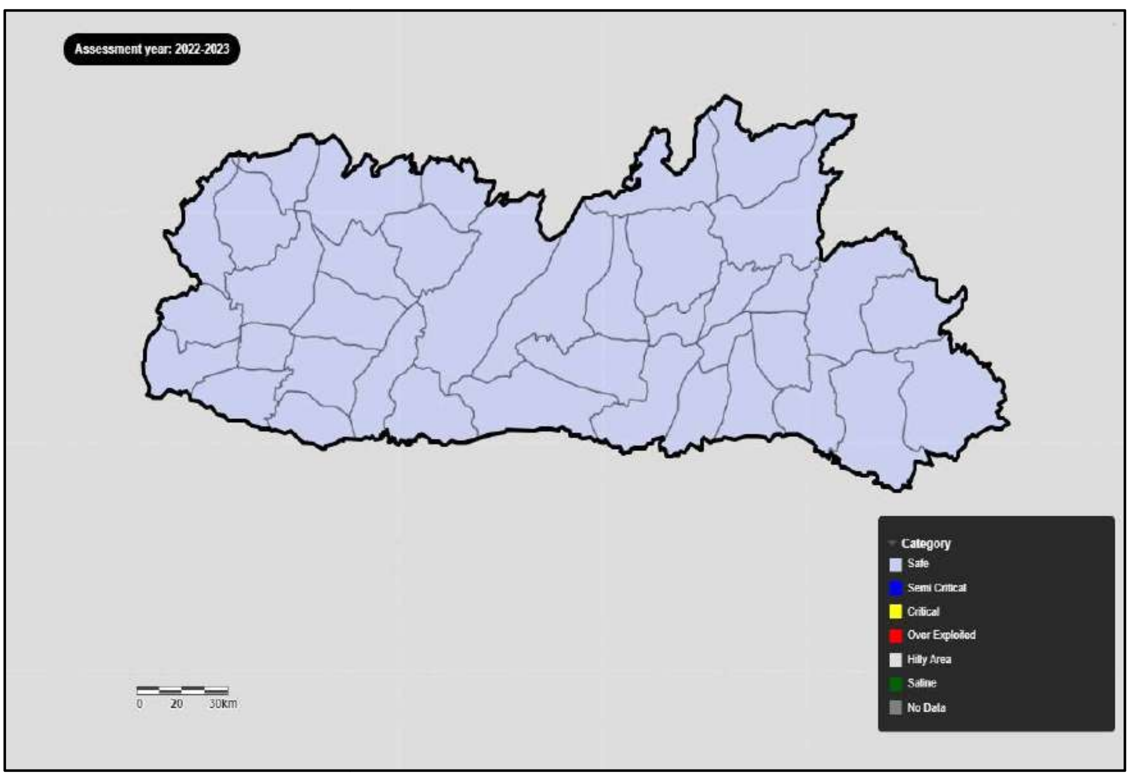
Out of 39 assessment units, all are categorized as‘Safe’ assessment units and there are no saline assessment unit.

Similarly, out of 8171.35 sq km recharge worthy area of the State, 8171.35 sq km (100 %) under ‘Safe’ categories of assessment units. Out of total 1507.61 mcm annual extractable ground water resources of the State, 1507.61 mcm (100 %) are under ‘Safe’ categories of assessment units.

As compared to 2022 assessment, the Annual Ground Water Recharge has increased from 1.72 to 1.83 bcm. The reasons can be attributed to increase in recharge from other sources. The Ground Water Extraction has increased minutely. Therefore, Stage of ground water extraction has slightly increased from 3.55 % to 4.58 %.



Dynamic Ground water Recourses Scenario 2023 – Meghalaya



Categorization Map of GWRA 2023 – Meghalaya

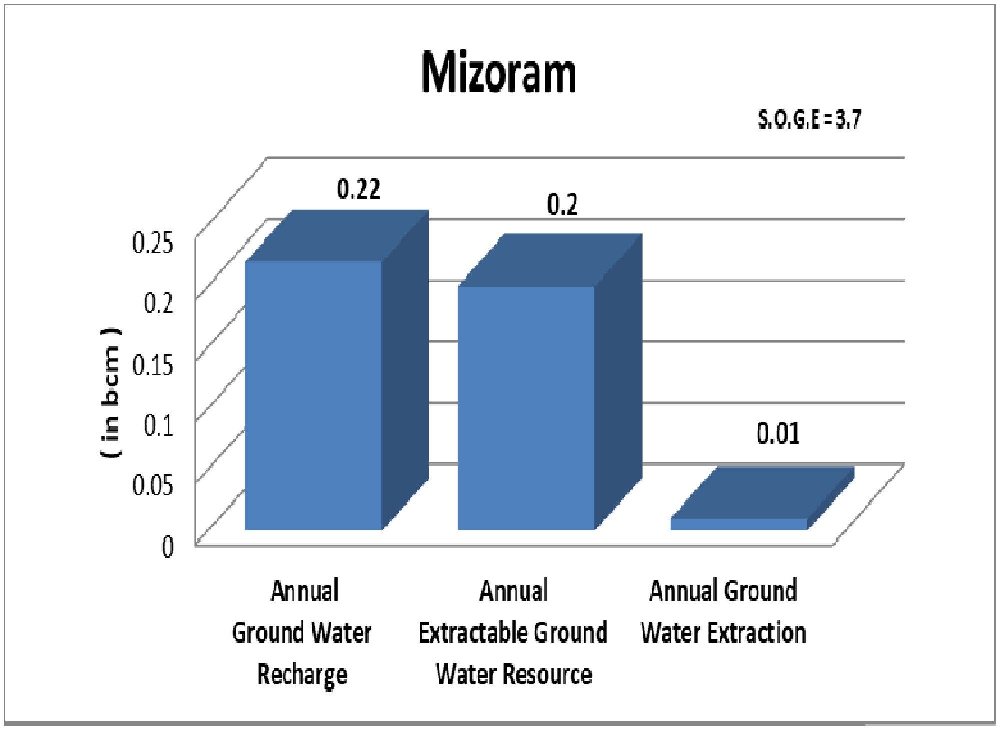
7.18 MIZORAM

The State is occupied mainly by the rocks of the Tertiary formation ranging in age from Oligocene to Miocene to Recent. The Barail formation the lowermost rock units comprising siltstone and bands of soft and hard fine-grained sandstone with strings of carbonaceous material and occur in the north eastern part of the state. The Surma is divided into two formations, Bhuban and Bokabil. The Bhuban is made up of grey sandstone and shale and occupies the major part of the State along the length of the state. The Bokabil, predominantly argillaceous, mostly occurs along the western part of the State. The Tipam sandstone is of semi- consolidated nature comprising medium to coarse grained sandstone with subordinate shale and occurs in limited extent in the north western part of the state. The alluvial deposits comprising silt, clay and sands occur in the valley fill area with very limited thickness. Ground water is restricted only to valley filled areas and secondary porosities of semi-consolidated rocks. These aquifers are the main source for springs. Ground water stored in the hill slopes emanates in the form of springs, which are being used as a source for water supply. In the valley area, the yield potential of tube wells within the depth range of 200 m tapping Tertiary sandstone ranges from 120 to 330 liters per minute (lpm) for drawdown of 13 to 20 m. The transmissivity and Storativity are to the tune of 11 to 46 m^2/day and 4.28 x 10^{-4}respectively.

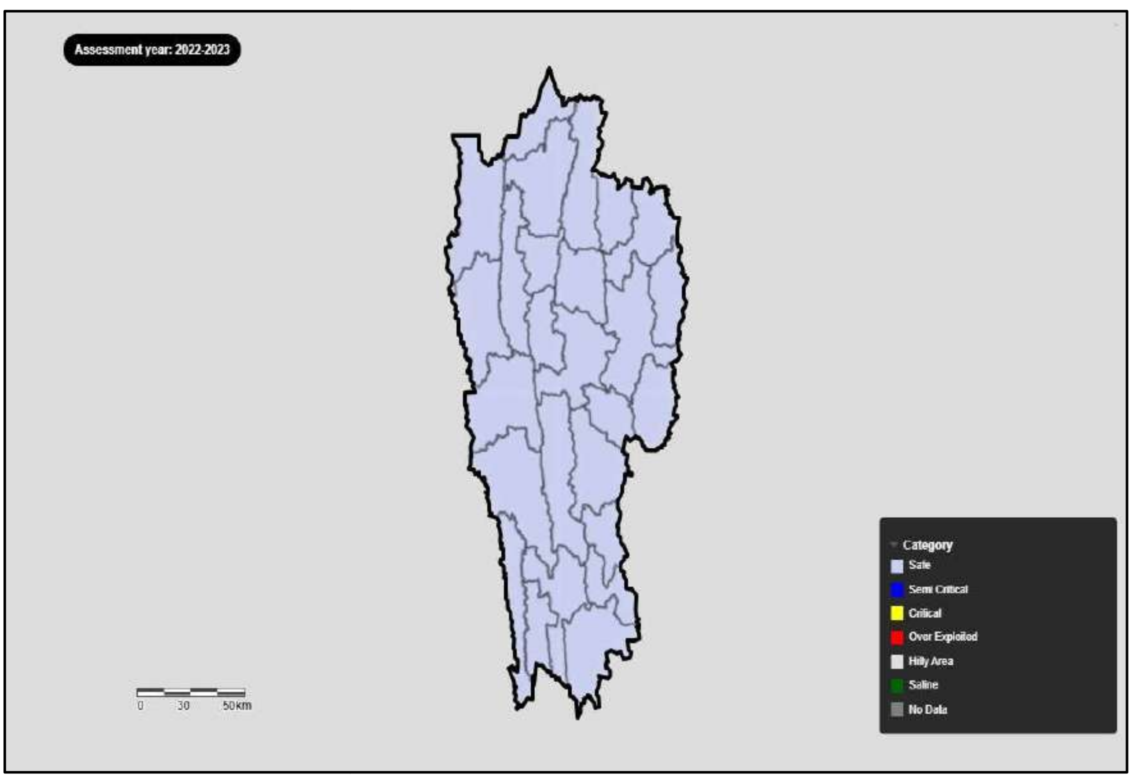
The ground water resources for the state have been assessed block-wise. Total Annual Ground Water Recharge has been assessed as 0.22 bcm and Annual Extractable Ground Water Resource is 0.2 bcm. The Annual Ground Water Extraction is 0.007 bcm and Stage of Ground Water Extraction is 3.7 %. All the 26 assessed blocks have been categorized as ‘Safe’. There are no saline areas in the state.

Similarly, out of 3149.41 sq km recharge worthy area of the State, 100 % of the area under ‘Safe’ categories of assessment units. All the total 199.56 mcm annual extractable ground water resources of the State, are under ‘Safe’ categories of assessment units. The comparison with previous assessment shows there is no major changes in the Ground Water Resources of Mizoram.

As compared to 2022 assessment, there is no major change in Annual Groundwater Recharge, Annual Groundwater Extractable Resources and Groundwater Extraction. Stage of GW Extraction has decreased marginally from 3.96 % in 2022 to 3.7 % 2023.



Dynamic Ground water Recourses Scenario 2023 – Mizoram



Categorization Map of GWRA 2023 – Mizoram

7.19 NAGALAND

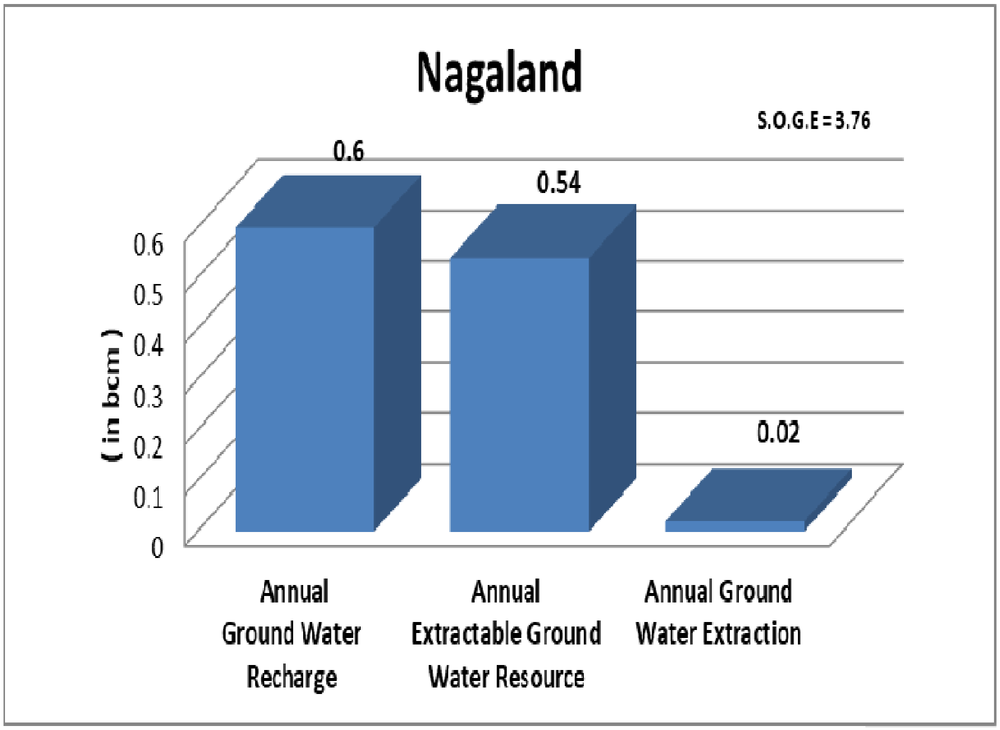
The State is covered by rocks ranging in age from Pre-Cretaceous to Recent. The rock sequences comprise the geosynclinals facies, represented by Disang Group, Barail Group, Surma Group, Tipam Group, Namsang formation and Dihing Group. While the Disang and Surma Group of rocks are mainly argillaceous, the Barail and Tipam groups are Arenacious. The Girujan clay formation overlying the Tipam sandstones is characterized by typical blue, mottled clay and argillaceous sandstone beds. Older rocks occupy southern parts of the State, where as younger rocks are exposed in the northern parts. The unconsolidated alluvial plains, comprising clay, sand pebble, cobble and boulder assemblages, occupy the narrow, intermountain and open valleys in the northern part of the state bordering upper reaches of Brahmaputra flood plains of Assam. The consolidated formations are confined to the south eastern part of the State along the Burma (Myanmar) border.

Ground water development potentiality in valley fill and alluvial deposits are restricted to construction of open wells having depth of 15 to 20 meters and deep tube well down to 100 m depth which yield to the tune of 10 to 45m^3/day with more than 5m drawdown. Water bearing formations pertaining to Tertiary deposits are found to have moderate potentials which can sustain deep tube wells having yield prospects varying from 10 to 20m3/hr. The valleys underlain by Tipam sandstones form good aquifers with yield prospects varying from 30 to 80m^3/hr. In the consolidated formations, ground water abstraction structures can be constructed in structurally weak zones. Ground water emerges as perennial springs which are the main source of water supply for domestic needs in the state.

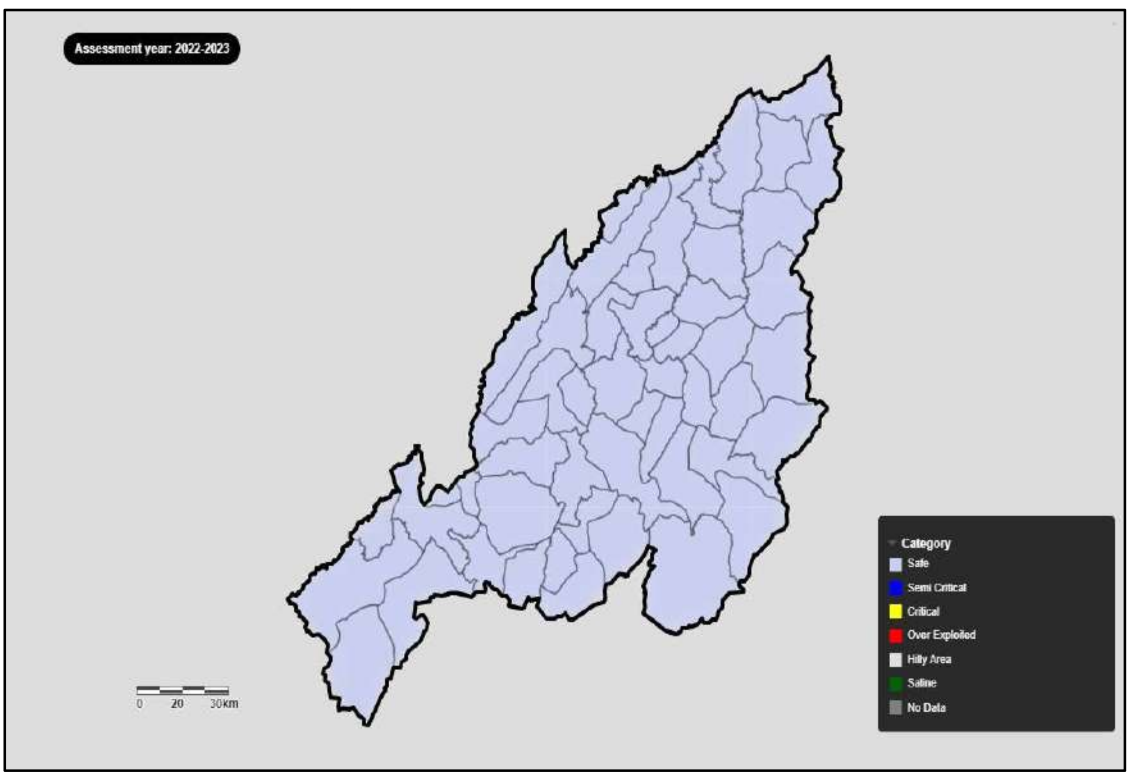
The ground water resources for the state have been assessed block-wise. Recharge worthy area of Nagaland has been reassessed and hilly areas are demarcated where the slope is more than 20% using Shuttle Radar Topographic Mission (SRTM) Digital Elevation Model (DEM) with 30m resolution data and geomorphological maps. The total Annual Ground Water Recharge of the State has been assessed as 0.60 bcm and Annual Extractable Ground Water Resource as 0.54 bcm. Annual Ground Water Extraction is 0.02 bcm and Stage of Ground Water Development is 3.76%. All the 52 Assessment Units have been categorized as ‘Safe’. There is no saline area in the state.

Similarly, out of 3855.07 sq km recharge worthy area of the State, 100 % of the area is under ‘Safe’ categories of assessment units. The entire 543.76 mcm annual extractable ground water resources of the State is under ‘Safe’ categories of assessment units.

As compared to 2022 assessment, Annual Ground Water Recharge of the State has decreased from 0.79 bcm to 0.60 bcm. The Annual Extractable Ground Water Resource has decreased from 0.71 bcm to 0.54 bcm and there is no significant change in annual ground water extraction. The Stage of Ground Water Extraction has increase from 2.89 % to 3.76 %.



Dynamic Ground water Recourses Scenario 2023 – Nagaland



Categorization Map of GWRA 2023 – Nagaland

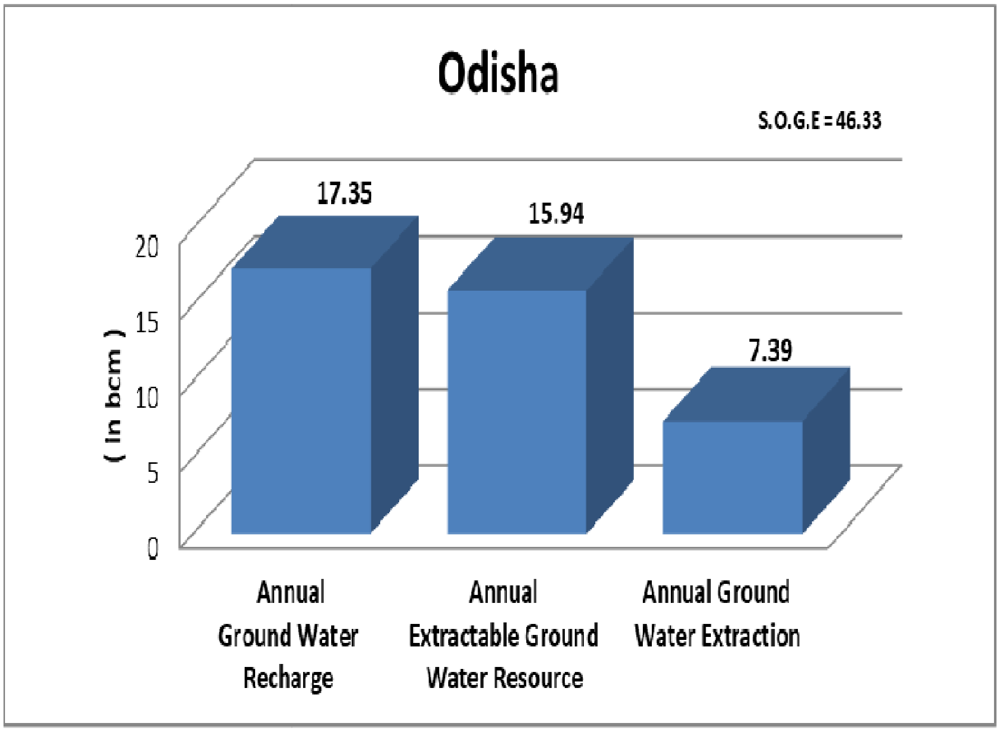
7.20 ODISHA

The State is underlain by diverse rock types, which range in age from Precambrian to Cenozoic era. The Precambrian occupy nearly 80 % of the total geographical area of the State. The Tertiary and the Quaternary Alluvial formations are restricted mainly to the narrow coastal tracts. The Gondwana group of rocks belonging to Paleozoic and Mesozoic era occurs in isolated patches in different parts of the State. These formations occur in Talcher area of Angul district and in river valley area of Sambalpur and Sundargarh districts. Ground water abstraction in the state is mostly done by dug wells constructed in the weathered zone in hard rock areas and in shallow phreatic aquifers in alluvial areas. The yield of open (dug) wells varies from 1 to 5 lps. However, at present, bore wells, shallow to medium deep tube wells, filter point tube wells are also in use for ground water abstraction both for domestic and irrigational purpose. The yield of bore wells varies from 2 to 5 lps in general depending on the occurrence of saturated fractures at depths. The yield from shallow and medium deep tube wells may vary from 6 to 10 lps in general depending on the aquifer disposition.

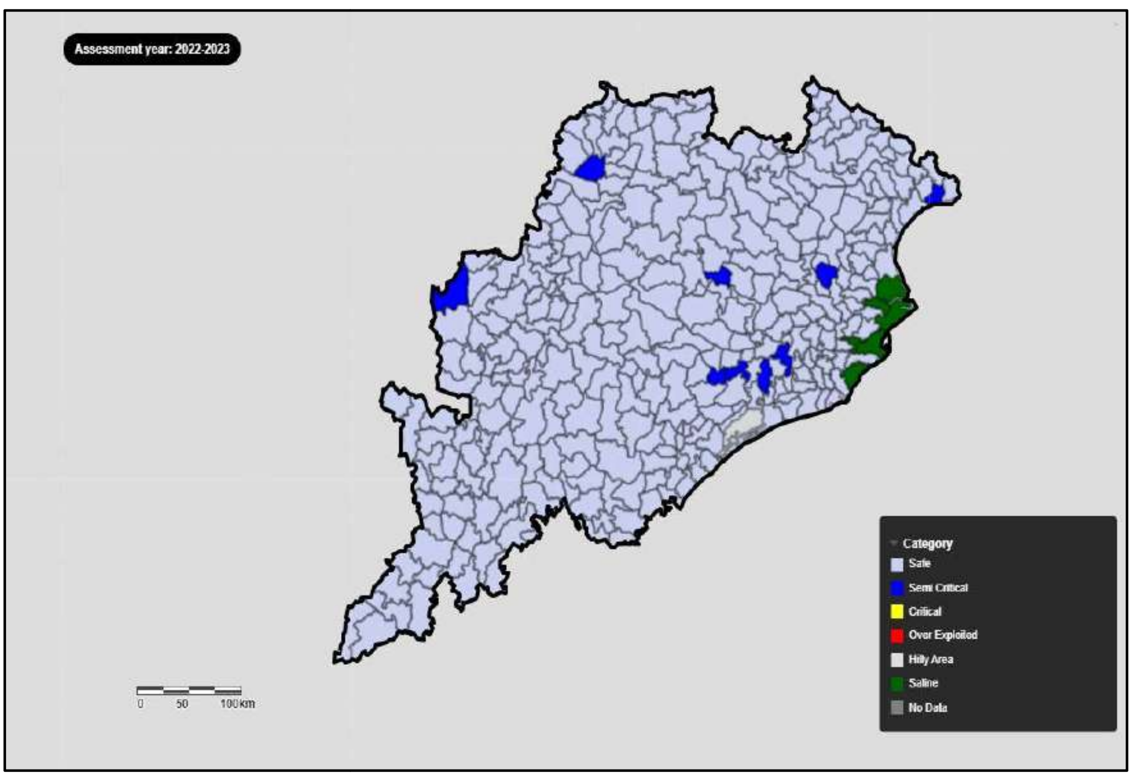
The Ground water resources in the state have been assessed block-wise. Total Annual Ground Water Recharge of the State has been assessed as 17.35 bcm and Annual Extractable Ground Water Resource as 15.94 bcm. The Annual Ground Water Extraction is 7.39 bcm and Stage of Ground Water Extraction is 46.33 %.

Out of the total of 314 assessment units (blocks), 9 units (2.87 %) have been categorized as 'Semi-critical', 299 units (95.22 %) as 'Safe' and 6 units (1.91 %) as 'Saline' categories of assessment units. Similarly out of 121593.15 sq km recharge worthy area of the State, 3339.96 sq km (2.75 %) area are under 'Semi-critical', 116071.86 sq km (95.46 %) under 'Safe' and 2181.33 sq km (1.79 %) area under 'Saline' categories of assessment units. Out of total 15933.74 mcm annual extractable ground water resources of the State, 499.73 mcm (3.14 %) are under 'Semi-critical' and 15434.01mcm (96.86 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, the Annual Ground Water Recharge has decreased from 17.79 to 17.35 BCM. Similarly Annual Extractable Ground Water Resource has decreased from 16.34 to 15.94 bcm and total annual ground water extraction for all uses has increased from 7.23 to 7.39 bcm. The stage of ground water extraction has increased to 46.33 % in 2023 as compared to 44.25 % in 2022.



Dynamic Ground water Recourses Scenario 2023 – Odisha



Categorization Map of GWRA 2023 – Odisha

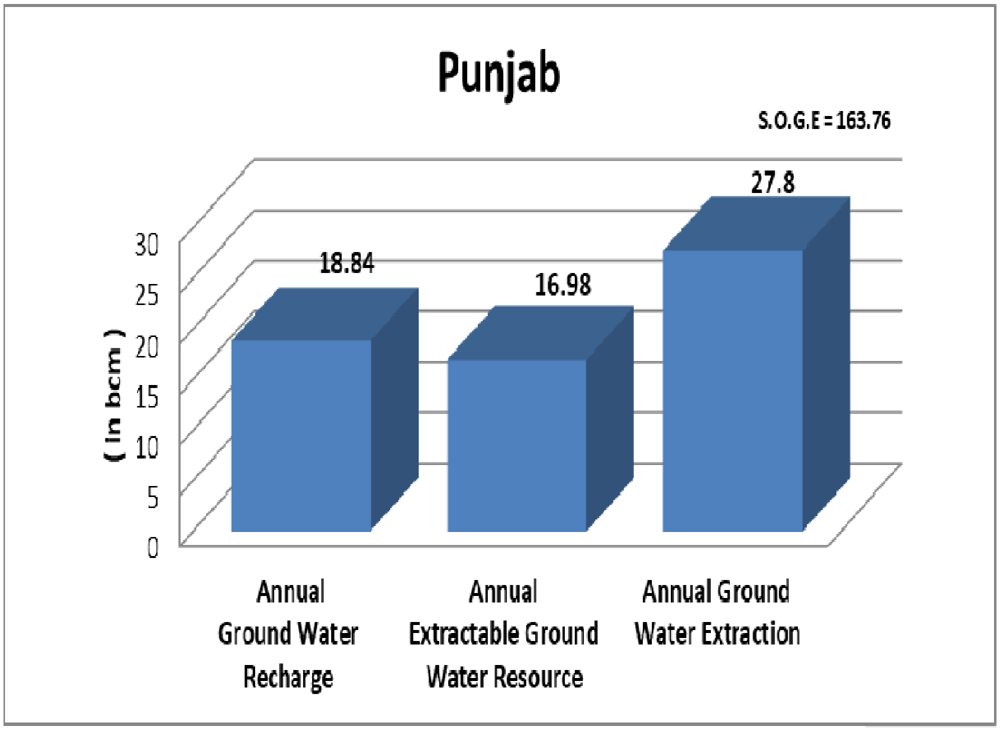
7.21 PUNJAB

Punjab is one of the smallest states of India having 3 perennial rivers namely Sutlej, Beas and Ravi and one non- perennial river Ghaggar. The Punjab State is a flat alluvial plain having a thin belt of mountains along north eastern border and stable sand dunes are seen dotting the landscape in the south western parts. The alluvial deposits in the State comprise sand, silt and clays often mixed with kankar. Sandy zones of varying grade constitute abundant ground water resources & act as a reservoir. The alluvial plain towards the hills is bordered by the piedmont deposits comprising Kandi and Sirowal. Immediately south-west of the hills, Kandi belt is 10 to 15 km wide followed by Sirowal which imperceptibly merges with the alluvial plain. Kandi deposit explored up to 450 m depth show gradation from boulders to clays and at places an admixture of various grades in different proportions. The Sirowal deposit is essentially composed of finer sediments but occasional gravel beds are also encountered in them.

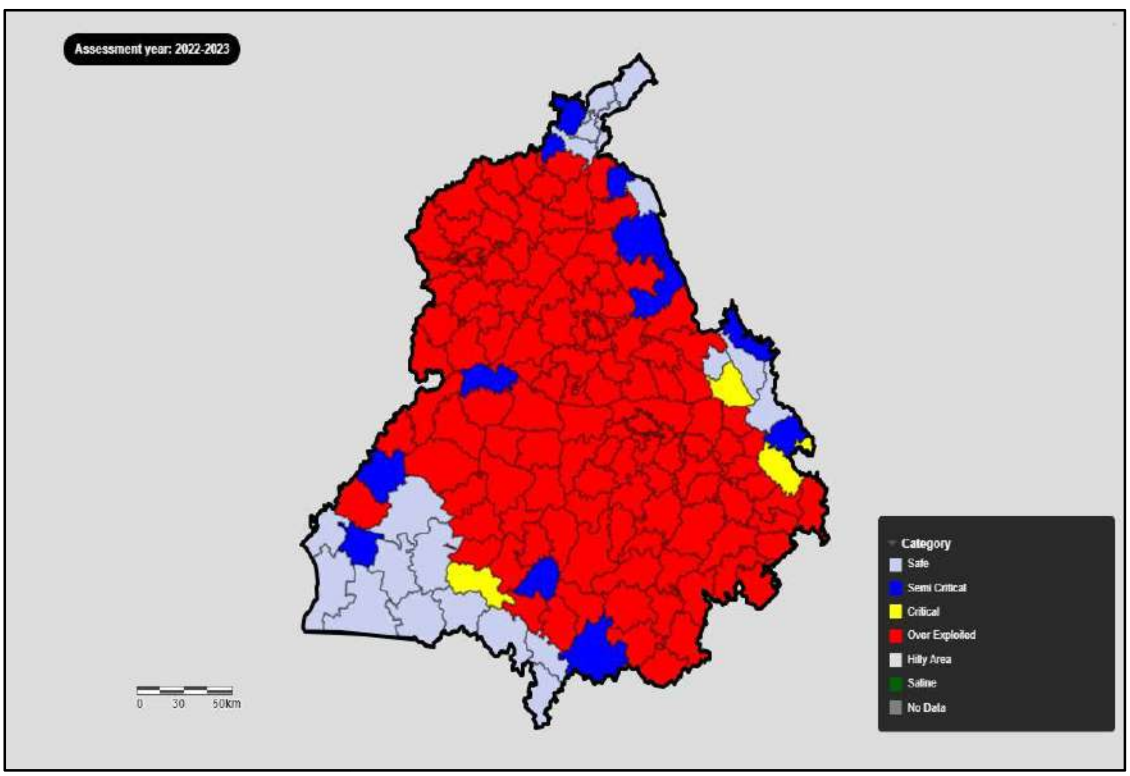
The ground water resources for the state have been assessed block-wise. Total Annual Ground Water Recharge of the State has been assessed as 18.84 bcm and Annual Extractable Ground Water Resource as 16.98 bcm. The Annual Ground Water Extraction is 27.8 bcm and Stage of Ground Water Extraction is 163.76 %.

Out of total 150 assessed blocks and 03 Urban area taken for study, 114 blocks and 03 Urban Areas (total 76.47 %) have been categorized as 'Over-exploited', 03 blocks (1.96%) as 'Critical', 13 blocks (8.5%) as 'Semi Critical' and 20 blocks (13.07%) as 'Safe'. Similarly out of 50175.27 sq. km recharge worthy area of the State, 36515.30 sq km (72.8 %) area are under 'Over-Exploited', 1192.98 sq. km (2.38%) under 'Critical', 4307.45 sq km (8.58%) under 'Semi-critical' and 8159.54 sq km (16.26 %) under 'Safe'. Out of total 16978.36 mcm annual extractable ground water resources of the State, 12794.57 mcm (75.36 %) are under 'Over-exploited', 309.67 mcm (1.82 %) under 'Critical', 1360.17 mcm (8.01 %) under 'Semi-critical' and 2513.95 mcm (14.81 %) are under 'Safe' categories of assessment units.

As compared to 2022 estimates, the Annual Ground Water Recharge has decreased from 18.94 to 18.84 bcm and similarly, Annual Extractable Ground Water Resource decreased from 17.07 to 16.98 bcm and total current annual ground water extraction decreased 28.02 to 27.8 bcm (excluding Poor Quality 1.24bcm). The stage of ground water extraction has increased from 165.99% to 163.76 %. The reduction in recharge is due to less rainfall, lining of unlined canals, reduced recharge from ponds & tanks and decreased extraction is due to decrease in irrigation draft.



Dynamic Ground water Recourses Scenario 2023 - Punjab



Categorization Map of GWRA 2023 – Punjab

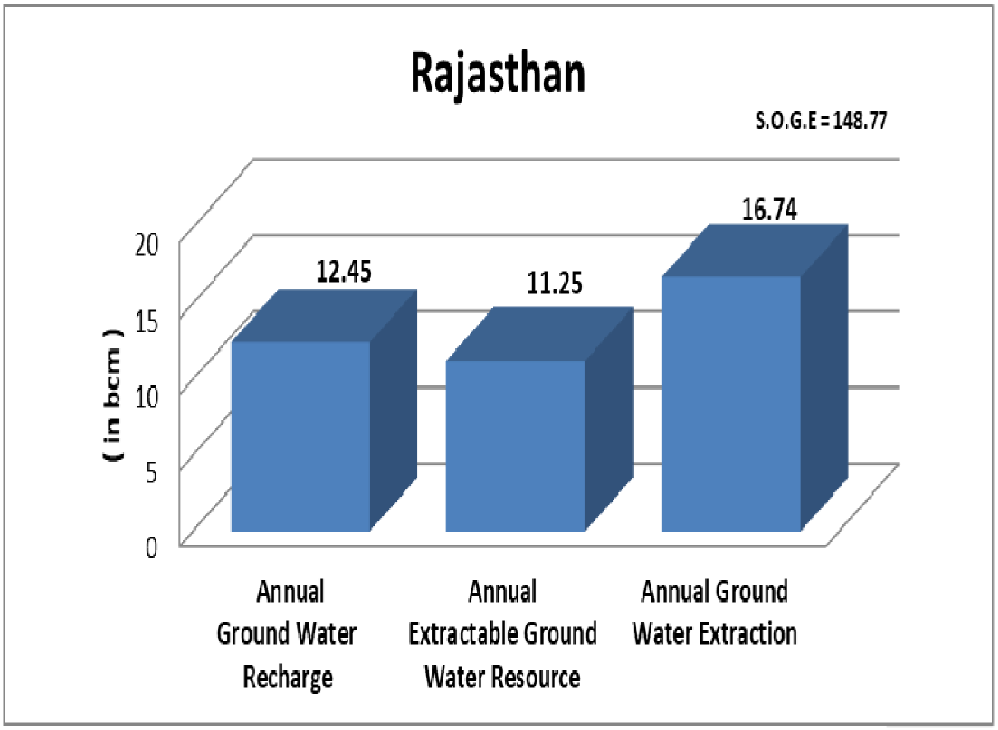
7.22 RAJASTHAN

The State of Rajasthan has diversified geology, ranging from Archean metamorphic to recent alluvial sediments. Based upon geological diversities, geomorphological setup and ground water potentialities, the state of Rajasthan can be divided into three broad hydrogeological units. (i) Unconsolidated formation (ii) Semi-consolidated formation (iii) Consolidated (Fissured formation). Large part of the State is underlain by Quaternary sediments (Thar Desert) consisting of clay, silt, sand and gravel of various grades. Exploratory drilling data reveals that the yield vary from meager to 10 m^3/day, transmissivity ranges between 80 to 300 m^2/day and storage co-efficient vary from 1.1x 10^{-5} to 3.9x 10^{-6} in the state. Ground Water occurs within the weathered residue and in the secondary porosity in Sandstone belonging to the Vindhyan formation. Yield potential is limited due to compact nature of the formation. The limestone is also having low ground water potential. The yields of dug wells vary from 0.25 to 0.75 m^3/day. The yield of the wells drilled in Vindhayan formation has been observed to be 15 m^3/day, tapping fractures between 50-75 m bgl. In consolidated formation (Fissured) the thickness of the weathered zone varies from 5 to 50 m. Ground Water occurs under unconfined condition within the weathered zone. The results of the exploratory drilling carried out by CGWB in hard rock are as indicate presence of productive fractures down to the depth of 100 m and yield varies from 3 to 15 m^3/day, whereas transmissivity varies from 3 to 30 m^2/day.

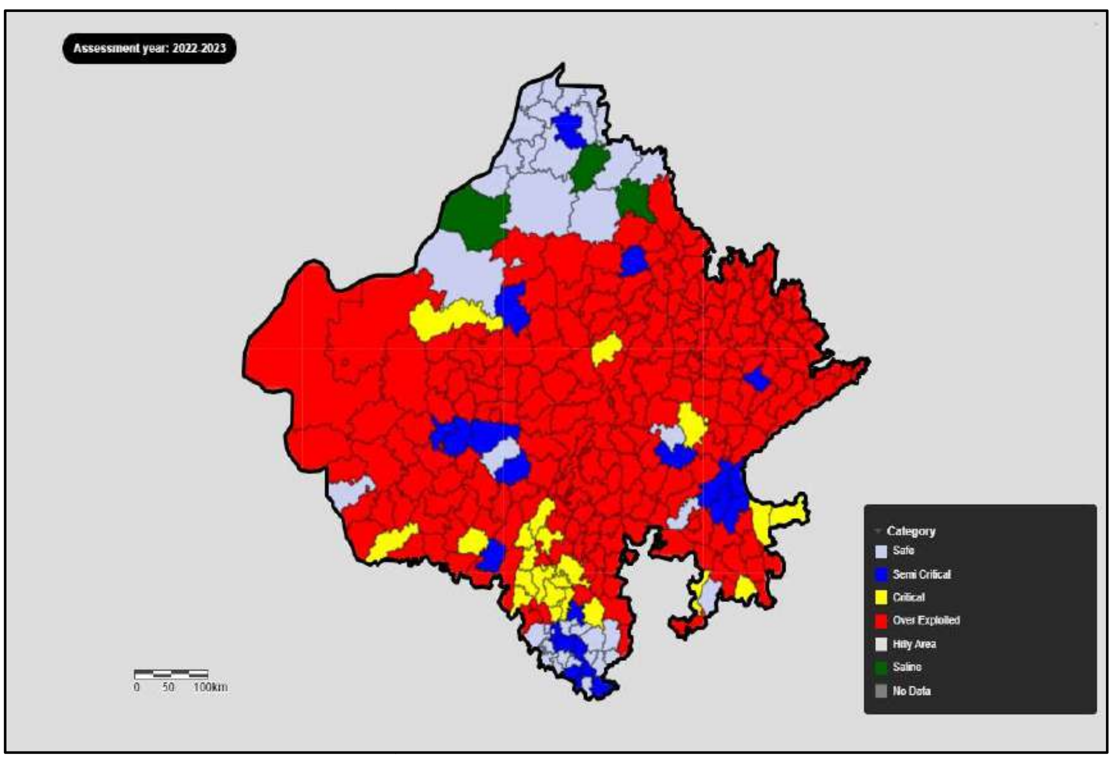
The dynamic ground water resources for the state have been assessed block-wise. Total Annual Ground water Recharge of the State has been assessed as 12.45 bcm and Annual Extractable Ground Water Resource as 11.25 bcm. The Annual Ground Water Extraction is 16.74 bcm and the Stage of ground water extraction in the state is 148.77 %.

In the year 2023, 07 (seven) new urban assessment units have been added apart from 295 assessment units. This year also assessment has been done for 302 units. Out of the 302 assessment units (blocks and urban areas), 216 units (71.52 %) have been categorized as 'Over Exploited', 23 units (7.62 %) as 'Critical', 22 units (7.28 %) as 'Semi-Critical', 38 units (12.58 %) blocks as 'Safe' and 3 units (0.99 %) as 'Saline'. Similarly out of 317010.74 sq km recharge worthy area of the State, 222734.36 sq km (70.26 %) area are under 'Over-Exploited', 19808.7sq km (6.25 %) under 'Critical', 19080.79 sq km (6.02 %) under 'Semi-critical', 46451 sq km (14.65 %) under 'Safe' and 8935.89 sq km (2.82 %) area under 'Saline' categories of assessment units. Out of total 11251.35 mcm annual extractable ground water resources of the State, 8235.03 mcm (73.19 %) are under 'Over-exploited', 857.87mcm (7.62 %) under 'Critical', 935.81mcm (8.32%) under 'Semi-critical' and 1222.65mcm (10.87 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, the Annual Ground Water Recharge and Annual Extractable Ground Water Resource have increased from 12.13 bcm to 12.45 bcm and from 10.96 bcm to 11.25 bcm respectively. Annual ground water extraction has increases from 16.56 bcm to 16.74 bcm. The stage of ground water extraction has decreased from 151.07 % to 148.77 %. The change in Annual Ground Water recharge is because of change in rainfall for recharge and area under irrigation (both by surface water and ground water).



Dynamic Ground water Recourses Scenario 2023 – Rajasthan



Categorization Map of GWRA 2023 – Rajasthan

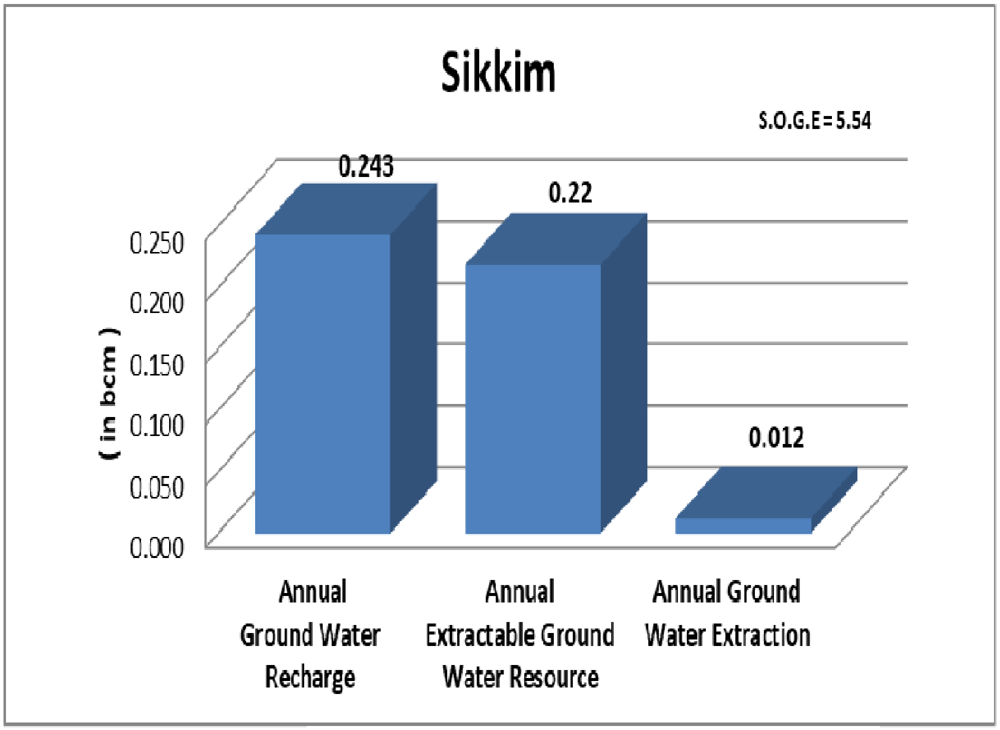
7.23 SIKKIM

Sikkim is a small mountainous State characterized by rugged undulating topography with series of ridges and valleys. The various rock types prevalent in the state are pelitic and carbonate rocks and Gondwanas over a gneissic basement and occasional colluviums and valley fill deposits, as well as alluvial terraces along higher order streams and river courses. The formations reveal an intense tectonic-structurally complex deformational history. Ground water occurs largely in disconnected localized pockets and in deeper fractures zones. Springs are the main source and conduits of water.

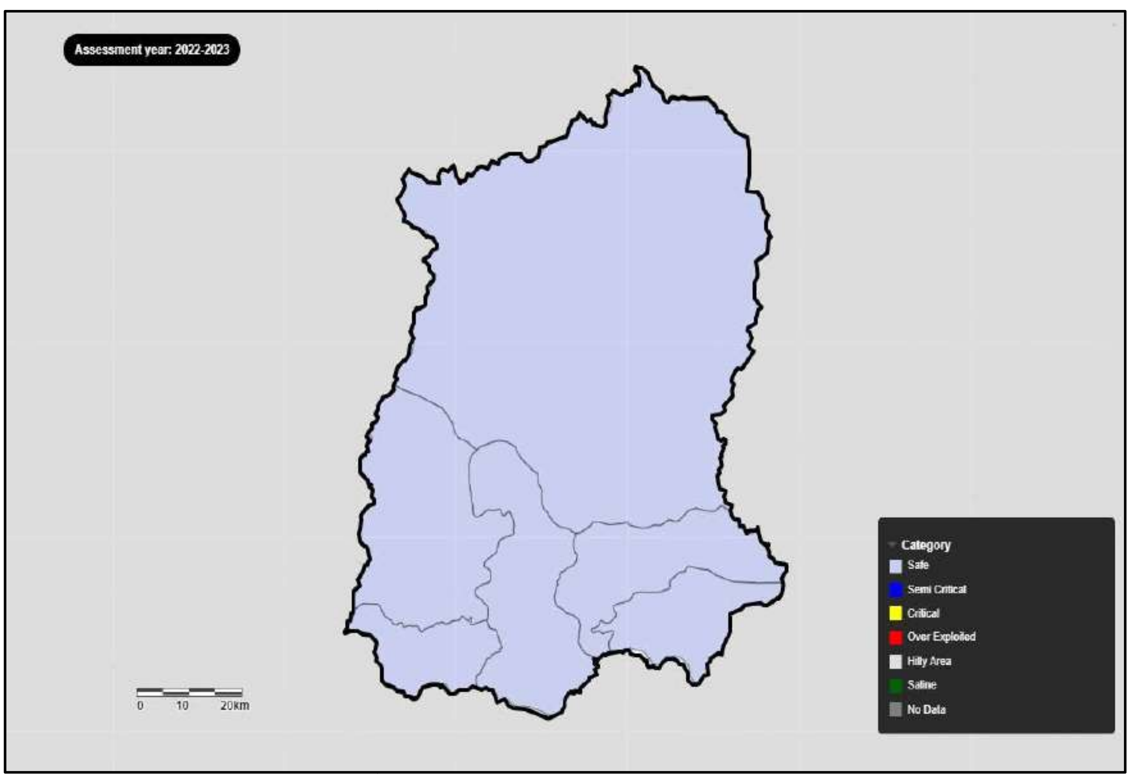
The ground water resource assessment (in 2023) for the State of Sikkim has been carried out as per GEC 2015 guidelines through 'IN-GRES', with Districts as primary assessment units. Total Annual Ground Water Recharge has been estimated at 0.243 bcm and Annual Extractable Ground Water Resource has been estimated at 0.219 bcm. Current Annual Ground Water Extraction for all uses has been estimated at 0.012 bcm, which translates into a Stage of Ground Water Extraction at 5.54 %, and as per the present assessment all the six assessment units (Six Districts – Gangtok, Gyalshing, Mangan, Namchi, Pakyong, Soreng) are in 'Safe' category.

All of the recharge worthy area (1496 sq km) and Total Annual Extractable Resource (218.68 mcm) is under 'Safe' category.

As compared to 2022 assessment, Total Annual Ground Water Recharge of the State has decreased from 0.27 bcm to 0.24 bcm. Annual Extractable Ground Water Resource reduced from 0.24 bcm to 0.22 bcm. The Annual Ground Water Extraction from all sources though marginally decreased from 0.014 bcm to 0.012 bcm. Stage of Ground Water Extraction decreased from 6.04 % to 5.54 %. Decrease in annual rainfall resulted in decrease in recharge, which is reflected in marginal decrease in Annual Extractable Resource.



Dynamic Ground water Recourses Scenario 2023 - Sikkim



Categorization Map of GWRA 2023 – Sikkim

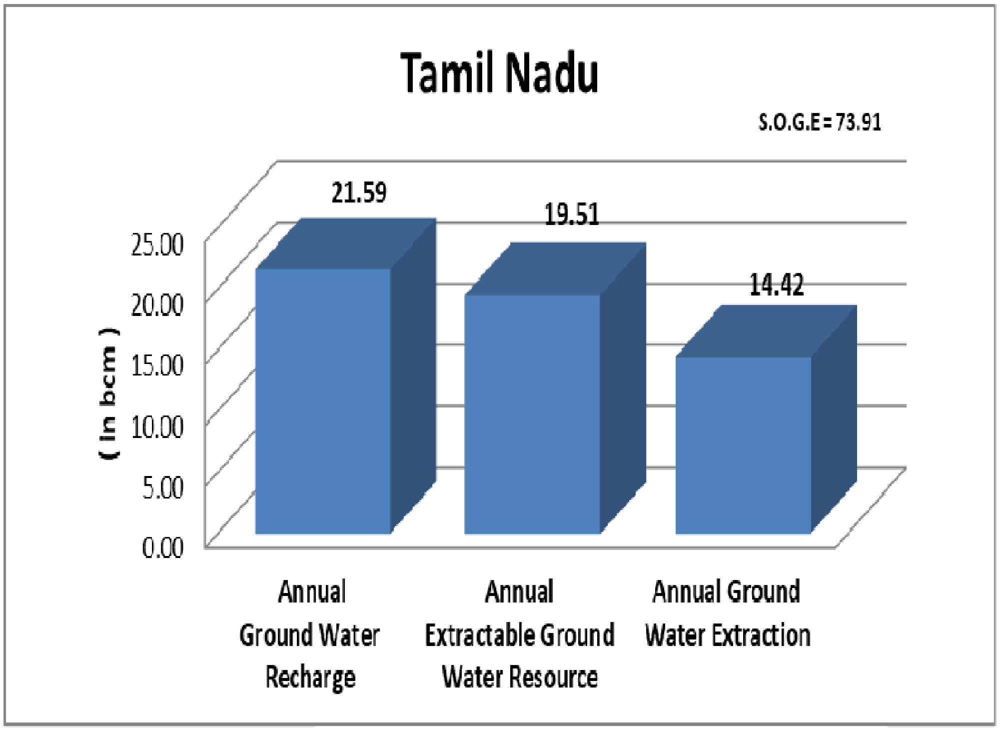
7.24 TAMIL NADU

Tamil Nadu state is underlain by diverse hydrogeological formations. Nearly 73 % of the state is occupied by hard rocks (consolidated), semi-consolidated and unconsolidated formations which are mainly confined to the eastern part including the coastal tract. In the hard rock areas, groundwater is developed through dug wells tapping the weathered zone and dug cum bore wells and bore wells tap the deeper fractures down to a depth of 300 m. In semi consolidated and unconsolidated formation, shallow zones are tapped by filter points and shallow tube wells and deeper zones through deeper tube wells. The yield of open wells vary from 1 to 3 lps, where as in dug wells tapping soft rocks including sedimentary formations, the yield is up to 10 lps. The yield from unconsolidated and semi consolidated formations are in general 10 to 20 lps and also as high as 40 lps are also noticed at select places.

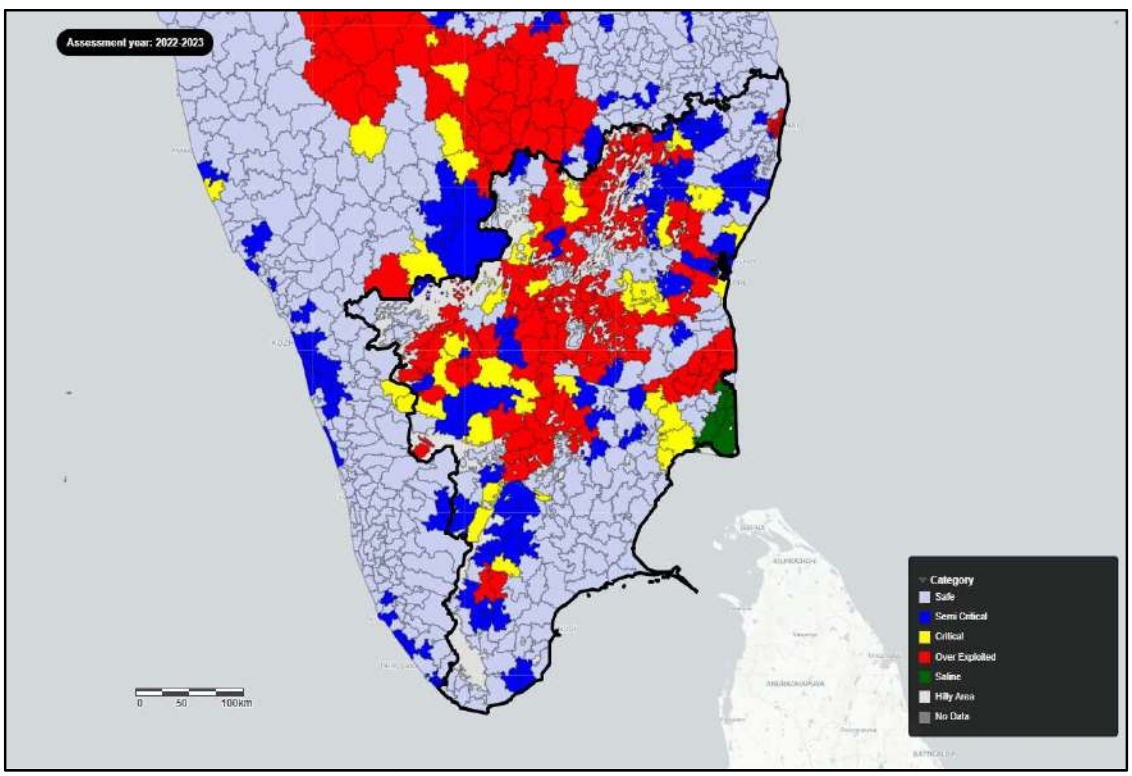
The ground water resources for the State have been assessed Block-wise and for the 2023 Ground Water Resource Assessment, 1202 Firkas were assessed. The Firka wise resources assessed were sum up to taluk level. Total Annual Ground Water Recharge of the State has been assessed as 21.59 bcm and Annual Extractable Ground Water resources as 19.51 bcm. The Annual Ground Water Extraction is 14.42 bcm and Stage of Ground Water Extraction as 73.91 %.

Out of 313 assessment units (taluka), 100 units (31.95 %) have been categorized as 'Over Exploited', 27 units (8.63 %) as 'Critical', 56 units (17.89 %) as 'Semi-Critical', 125 units (39.94 %) as 'Safe' and 5 units (1.60 %) have been categorized as 'Saline'. Similarly out of 108691 sq km recharge worthy area of the State, 31130 sq km (28.64 %) area are under 'Over-Exploited', 11774 sq km (10.83 %) under 'Critical', 19483 sq km (17.92 %) under 'Semi-critical', 44393 sq km (40.84 %) under 'Safe' and 1911 sq km (1.76 %) area under 'Saline' categories of assessment units. Out of total 19505.70 mcm annual extractable ground water resources of the State, 4772.59 mcm (24.47 %) are under 'Over-exploited', 2029.09 mcm (10.4 %) under 'Critical', 3776.06 mcm (19.36 %) under 'Semi-critical' and 8927.94 mcm (45.77 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, Total Annual Ground Water Recharge has marginally increased minutely from 21.11 to 21.59 bcm. The Annual Extractable Ground Water Resources has also marginally increased from 19.09 to 19.51 bcm and the annual ground water extraction has decreased marginally from 14.43 to 14.42 bcm. Consequently, there is a decrease in the stage of ground water extraction from 75.59 % to 73.91 % indicating overall improvement in ground water scenario. The increase in ground water recharge is due to changes in rainfall pattern and decreased extraction is due to decrease in the load on ground water resources in irrigation and domestic sector.



Dynamic Ground water Recourses Scenario 2023 – Tamil Nadu



Categorization Map of GWRA 2023 – Tamil Nadu

7.25 TELENGANA

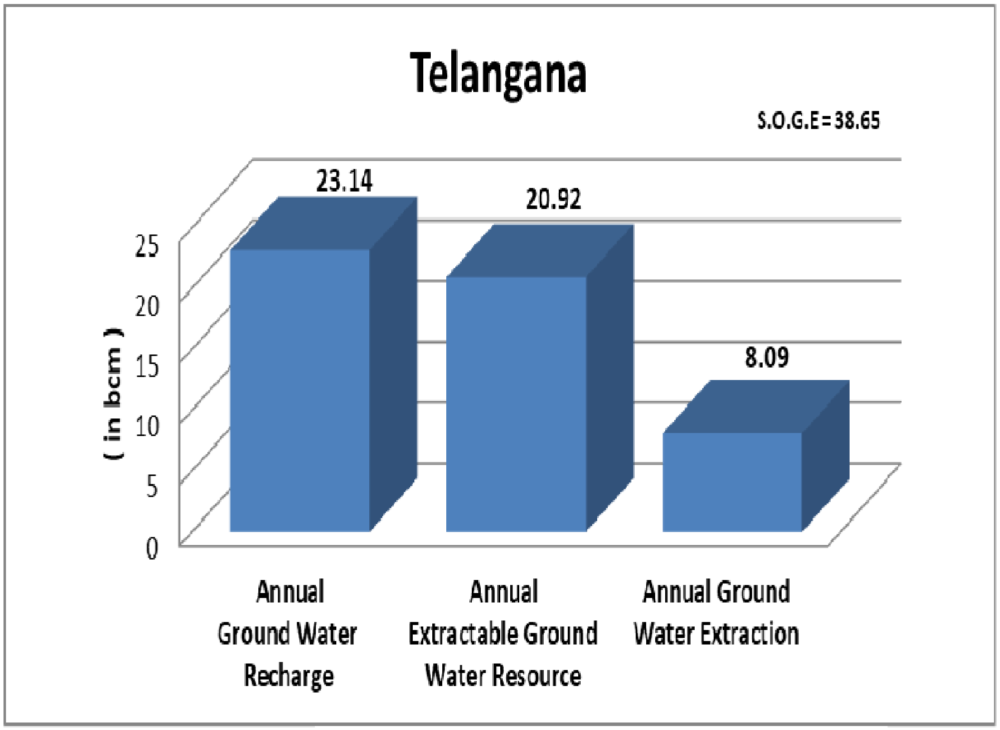
Telangana state is characterized by wide range of geological formations from Archaean to Recent age. Nearly 85% of the state is underlain by hardrocks (consolidated formations) belonging to the Peninsular Gneissic Complex, Dharwar and Eastern Ghats of Archaean to Middle Proterozoic age, Pakhal Group of rocks belonging to Middle to Upper Proterozoic age and Deccan Traps. In hardrocks average well yields are around 50 to 125 lpm. The rest of the state is underlain by semi consolidated sedimentary formations encompassing Gondwanas, Tertiary group of formations and Sub-Recent to Recent unconsolidated sediments. Transmissivity of these aquifers varies between 28 and 950m^2/day. The unconsolidated formations are represented by inland river alluvium.

The Ground water resources for the state have been assessed watershed-wise and apportioned to Mandal-wise. Total Annual Groundwater recharge of the State has been assessed as 23.14 bcm and Annual extractable Ground Water resource as 20.92 bcm. The Annual Ground Water Extraction is 8.09 bcm and Stage of Ground Water Extraction is 38.65 %.

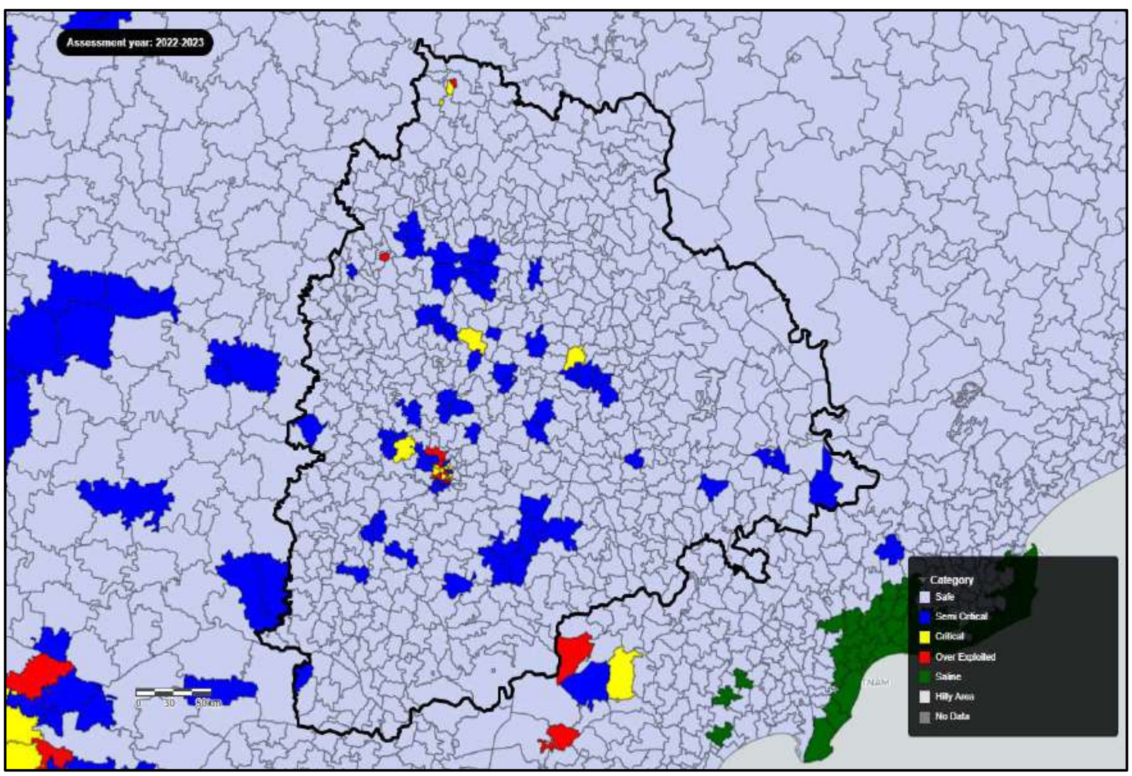
Out of 612 assessment units (Mandals), 11 units (1.8 %) have been categorized as ‘Over Exploited’, 10 units (1.63 %) as ‘Critical’, 61 units (9.97 %) as ‘Semi-Critical’ and 530 units (86.6 %) as ‘Safe’. There is no ‘Saline’ category of assessment unit in the state.

Similarly out of 105777.24 sq km recharge worthy area of the State, 156.44 sq km (0.15 %) area are under ‘Over-Exploited’, 605.7sq km (0.57 %) under ‘Critical’, 8510.64 sq km (8.05 %) under ‘Semi-critical’, 96504.46 sq km (91.23%) under ‘Safe’ categories of assessment units. Out of total 20920.92 mcm annual extractable ground water resources of the State, 20.08 mcm (0.1 %) are under ‘Over-exploited’, 97.23 mcm (0.46 %) under ‘Critical’, 1268.76 mcm (6.06%) under ‘Semi-critical’ and 19534.85 mcm (93.37 %) are under ‘Safe’ categories of assessment units.

As compared to 2022 assessment, Total Annual Ground Water Recharge of the State has increased from 21.27 to 23.14 bcm. This is mainly due to increase in recharge from ‘Other sources’. The Annual Extractable Ground Water Resources has increased from 19.25 to 20.92 bcm. The overall Stage of Ground Water Extraction decreased from 41.6 % to 38.65%. This 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 and copious rainfall received by the state during last year.



Dynamic Ground water Recourses Scenario 2023 – Telangana



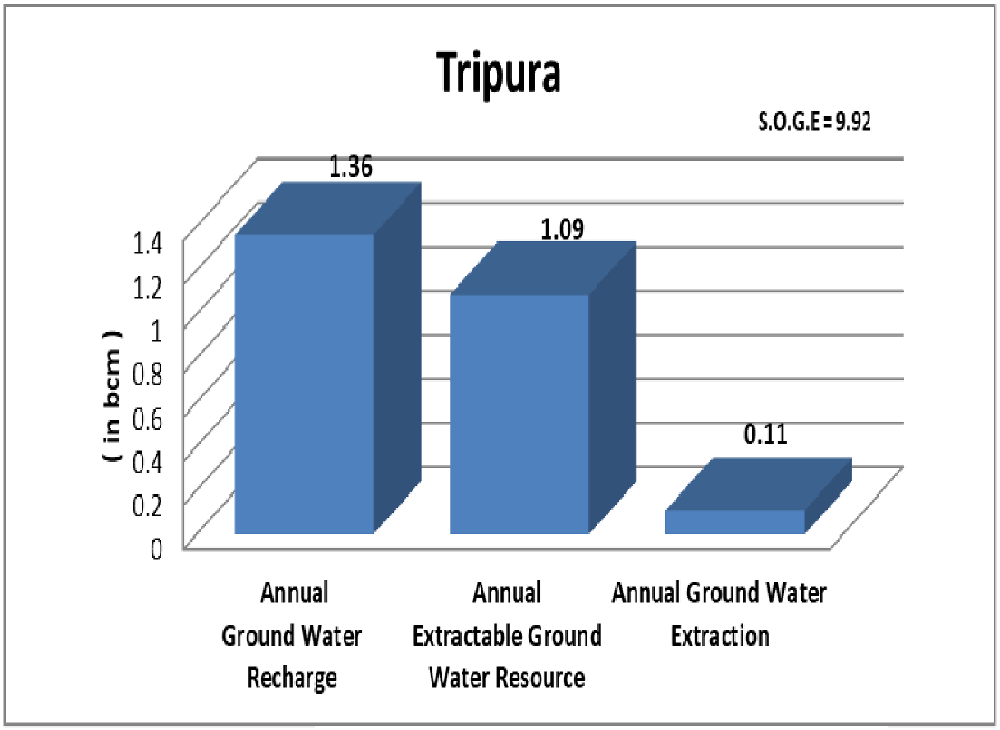
Categorization Map of GWRA 2023 – Telangana

7.26 TRIPURA

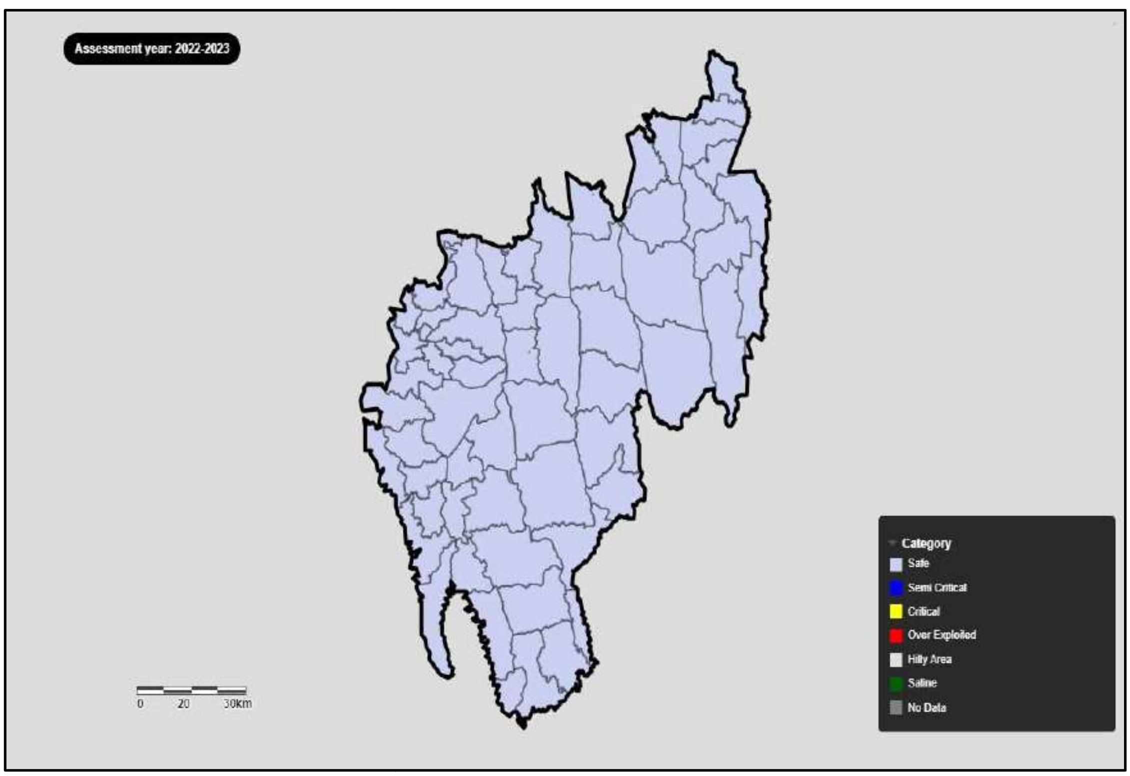
The State of Tripura is occupied by the rocks ranging in age from Upper Tertiary to Quaternary. Mobile trough geosynclinal deposition of Barail group followed by flysch type of Surma &Tipam sediments, overlain by Dupitila formation, is noticed in the State. Most of the longitudinal synclinal valleys of the state are the basins of deposition of recent formation. Recent alluvium occurs along the streams and the flood plains of major rivers.

Ground water occurs under unconfined condition in Dupitila, Recent &Tipam formations. Besides, it also occurs under confined to semi-confined conditions in Tipam formation at considerable depth. Recharge areas for the deeper aquifer lies in the adjacent anticlinal hills. Wherever a good thickness of impermeable clay beds underlie & overlie the saturated granular zones, auto flow artesian conditions have been found in the valleys, which are the discharge area. The artesian flowing conditions occur in patches both at shallow depth and at deeper depth. The auto discharge of the flowing wells in the State ranges from 100 to 6000 lph, the maximum auto discharge from deep tube well to the extent of 54000 lph has been found in Khowai valley near Khowai town, where the piezometric head rose up to 7 m above ground level.

Ground water resources have been assessed block-wise for recharge worthy area. Total Annual Ground Water Recharge of the State has been assessed as 1.36 bcm and Annual Extractable Ground Water Resource as 1.09 bcm. The Annual Ground Water Extraction is 0.11 bcm and Stage of Ground Water Extraction is 9.92 %. All the 59 assessment units have been categorized as 'Safe'.
The state has Recharge worthy area of 6197.84 Sq. Km and Total Annual Extractable Resource is of 1094.05 mcm is under 'safe' categories of assessment units.
As compared to 2022 assessment, there is no significant change in ground water recharge and ground water extraction in the State.



Dynamic Ground water Recourses Scenario 2023 – Tripura



Categorization Map of GWRA 2023 – Tripura

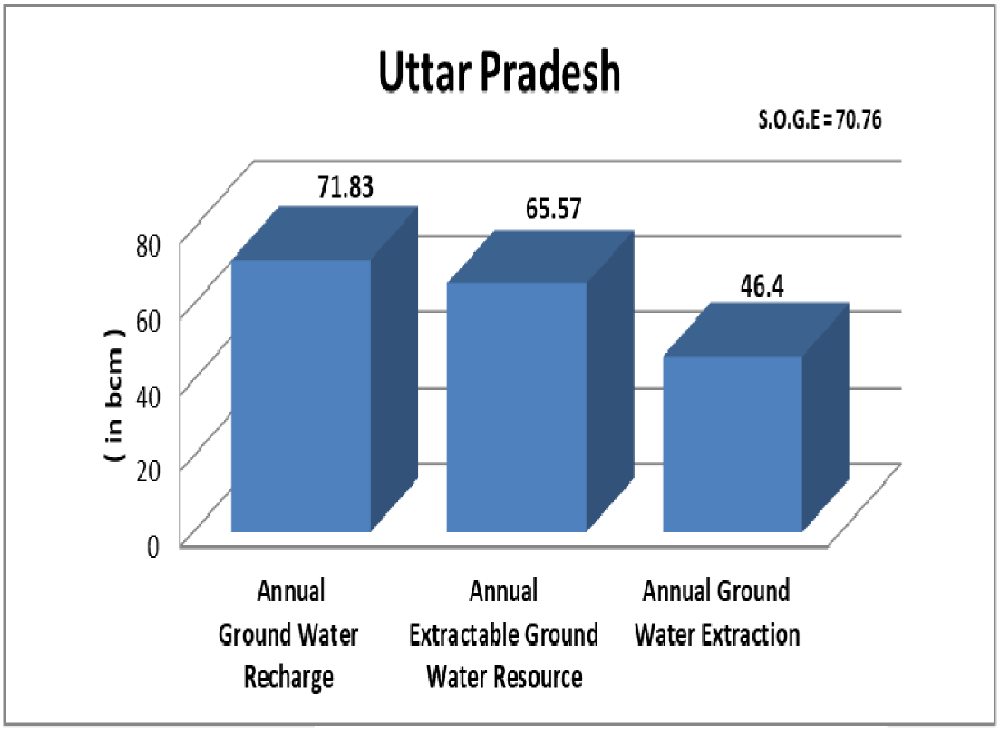
7.27 UTTAR PRADESH

The State of Uttar Pradesh is categorized with five distinct hydrogeological units – Bhabar, Terai, Central Ganga Plains, Marginal Alluvial Plain, Southern Hardrock area. Bhabar is mainly the recharge zone having deeper water levels. Ground water extraction in phreatic aquifer is through hand pumps, dug wells, dug cum bore wells and shallow tube wells. The yield from these wells has been generally found to be in the range of 40 to 60 lps. Terai zone lies between Bhabar in the North and Central Ganga Plain in the South. It is characterized by fine grained sediments with occasional pebbles and boulders. The average yield of tube wells constructed in this zone varies from 30 to 60 lps with moderate drawdown. Central Ganga Plain constitutes the most promising ground water repository characterized by multi-layered aquifer systems. The yield of the open wells and hand pumps constructed in the phreatic aquifer vary from 5 to 10 lps. The tube wells in the phreatic aquifer yield between 20 to 28 lps at 6 to 8 m drawdown. Marginal alluvial plain consists of kankar mixed clay-silt beds intercalated with sand and gravel lenses. The aquifer in this area is capable of yielding 15 to 40 lps at moderate drawdown. Southern part mainly occupied by Hard rocks comprising of Granite/ Granitic Gneiss and Marginal Alluvium in Bundelkhand Region and Vindhyan Sedimentary formations in Mirzapur and Sonebhadra Districts. The wells tapping these formations generally recorded yield between 2 to 8 lps. The Ground water resources of the State have been assessed block-wise.

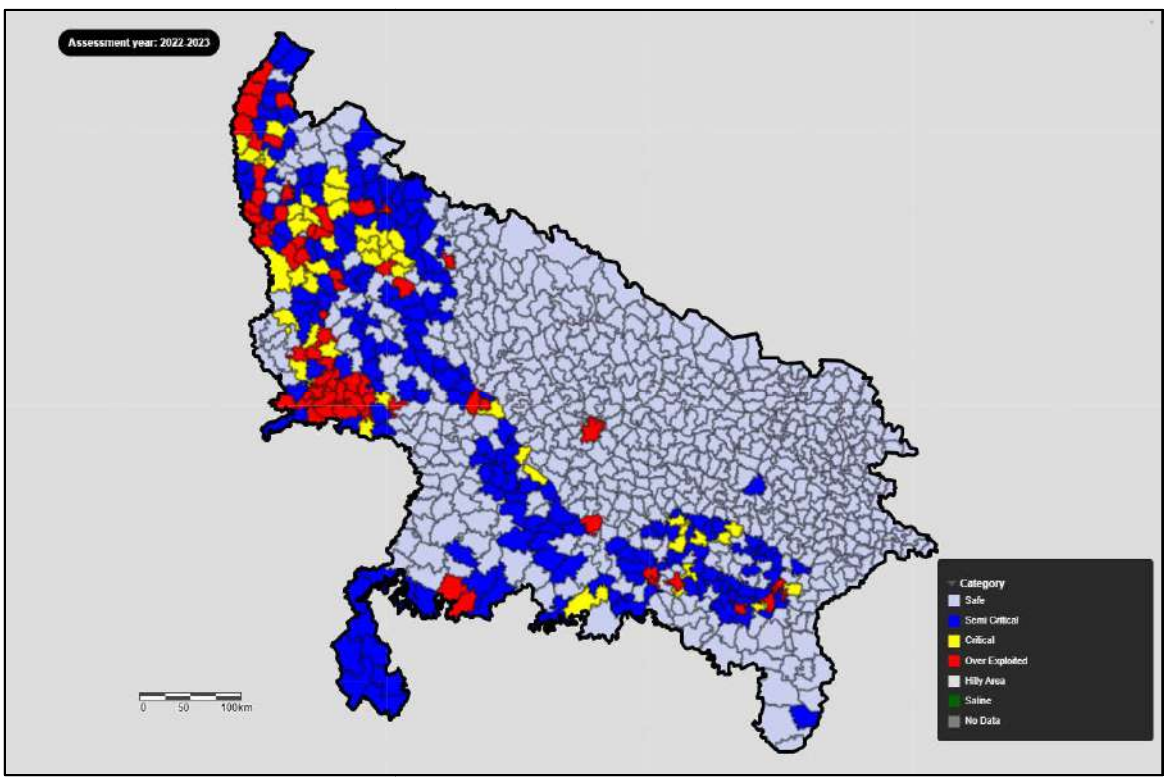
Total Annual Ground Water Recharge of the state has been assessed as 71.83 bcm and Annual Extractable Ground Water Resource as 65.57 bcm. The Annual Ground Water Extraction is 46.40 bcm and average Stage of Ground Water Extraction of the State is 70.76%.

Out of the 836 assessment units consisting 826 blocks and 10 cities, 62 units (7.42 %) have been categorized as 'Over- exploited', 43 units (5.14 %) as 'Critical', 172 units (20.57 %) as 'Semi-critical' and 559 units (66.87 %) as 'Safe'. Similarly, out of 229555.18 sq km recharge worthy area of the State, 14952.13 sq km (6.51 %) area are under 'Over-Exploited', 11777.16 sq km (5.13 %) under 'Critical', 51620.24 sq km (22.49 %) under 'Semi-critical', 151205.64 km (65.87 %) under 'Safe' categories of assessment units. Out of total 65571.79 mcm annual extractable ground water resources of the State, 3917.31 mcm (5.97 %) are under 'Over-exploited', 3276.41 mcm (5.00%) under 'Critical', 12977.06 mcm (19.79 %) under 'Semi-critical' and 45401.02 mcm (69.24 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, ground water recharge and ground water extraction figure increased minutely. The stage of ground water extraction has also marginally increased from 70.66 % to 70.76%.



Dynamic Ground water Recourses Scenario 2023 – Uttar Pradesh



Categorization Map of GWRA 2023 – Uttar Pradesh

7.28 UTTARAKHAND

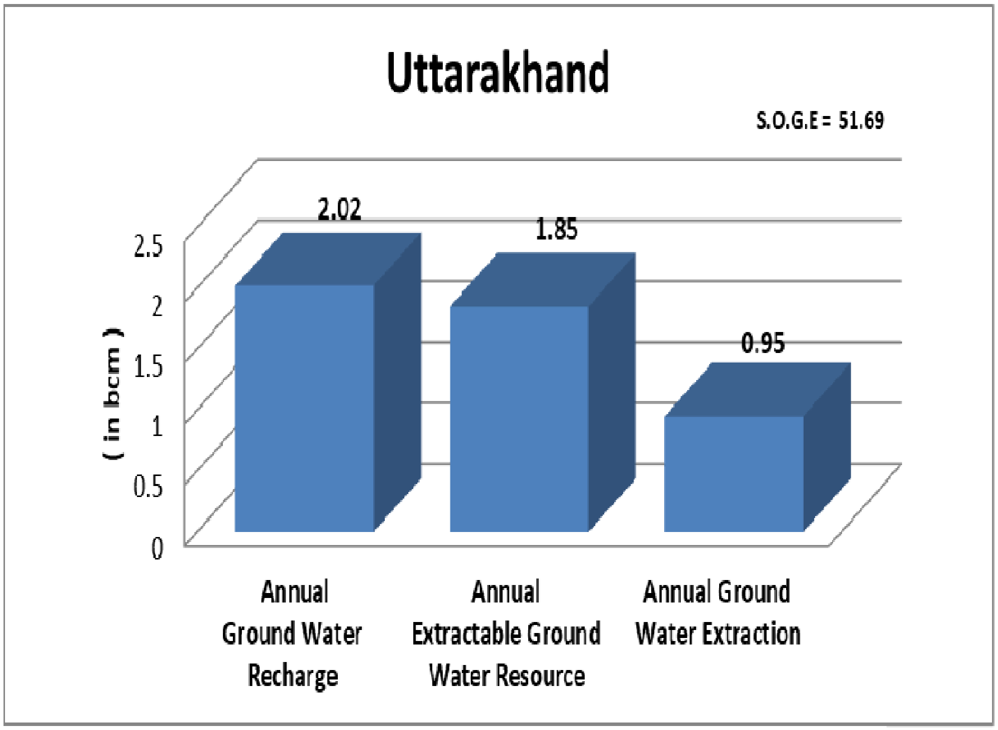
Uttarakhand State, a predominantly hilly state, covers a total geographical area of 53,483 km^2 and is situated between 28°43'20" – 31°28'00" N Latitude and 77°34'06" – 81°01'31" E Longitude. Most of the northern part of the state is covered by high Himalayan peaks and glaciers. The state shares international boundaries with China (Tibet) in the north and Nepal in the East. The assessment of dynamic ground water resources has been carried out in 18 assessment units (blocks) of the state.

Total Annual Ground Water Recharge in the State (2023) has been assessed as 2.02 bcm. Ground water resources are replenished through rainfall and other sources like return flow from irrigation, canal seepage etc. The main source of annual ground water recharge is rainfall, which contributes nearly 69.93 % of the Total Annual Ground Water Recharge. The Total Annual Extractable Ground Water Resource of the State has been assessed as 1.85 bcm. The Annual Ground Water Extraction of the State (2023) is 0.95 bcm, the largest user being irrigation sector. The Stage of ground water extraction for the entire State, is 51.69 %.

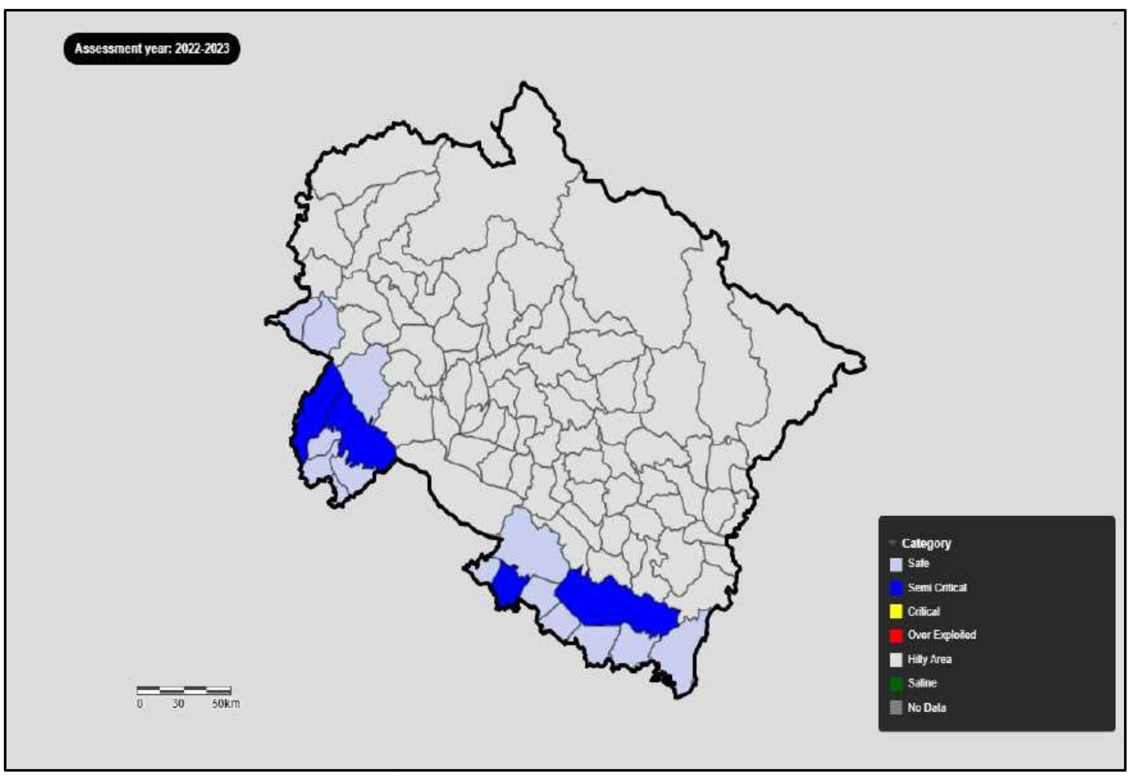
Out of the 18 assessed blocks of Uttarakhand State, 14 blocks (77.78%) are ‘Safe’, whereas remaining 4 blocks (22.23%) are categorised as ‘Semi Critical’.There are no issues related to groundwater quality in the assessment units and hence there is no poor quality or saline block in the State.

Out of 4993.04 sq km recharge worthy area of the State, 950.94 sq km (19.05 %) under ‘Semi-critical’, 4042.1 sq km (80.95 %) under ‘Safe’ category of assessment units. Out of total 1846.93 mcm annual extractable ground water resources of the State, 360.87 mcm (19.54 %) under ‘Semi-critical’ and 1486.07 mcm (80.46 %) are under ‘Safe’ categories of assessment units.

As compared to 2022 estimate, there is negligible changes in Annual Ground Water Recharge, Annual Extractable Ground Water Resources and Annual Ground Water Extraction. The stage of groundwater extraction has increased marginally from 48.04% to 51.69%.



Dynamic Ground water Recourses Scenario 2023 – Uttarakand



Categorization Map of GWRA 2023 – Uttarakand

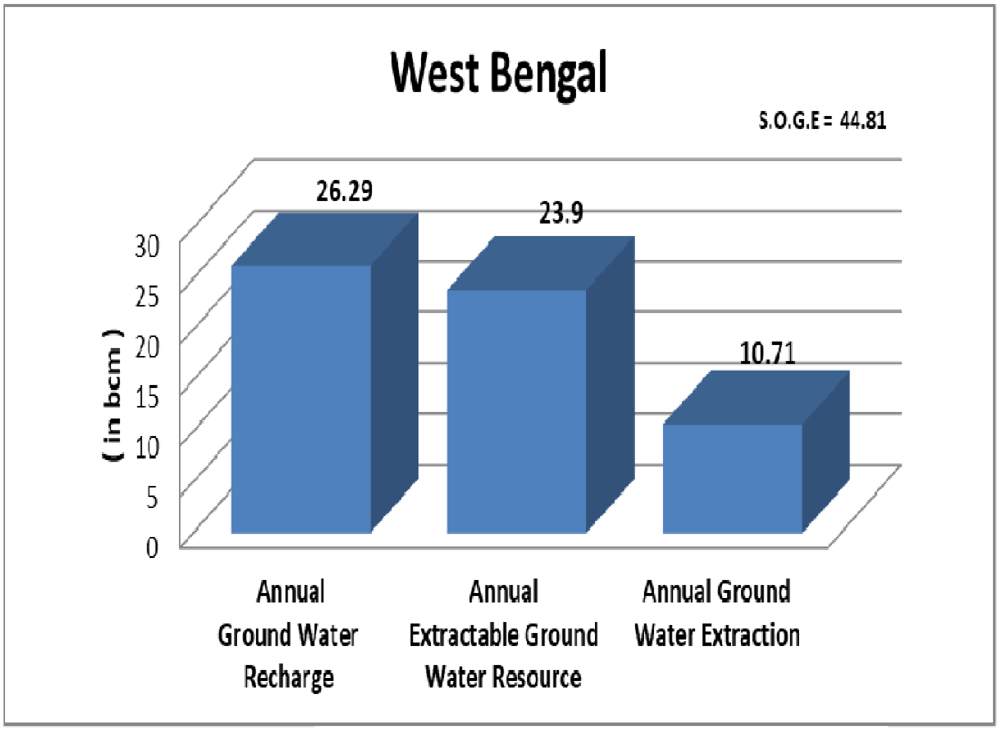
7.29 WEST BENGAL

Nearly two third area of the State is occupied by unconsolidated sediments; the western part of the state is partly occupied by the hard rocks. Phreatic aquifer is generally developed through dug well, dug cum bore well and shallow tube well. Yield potential of these wells varies from 1 to 5 lps.

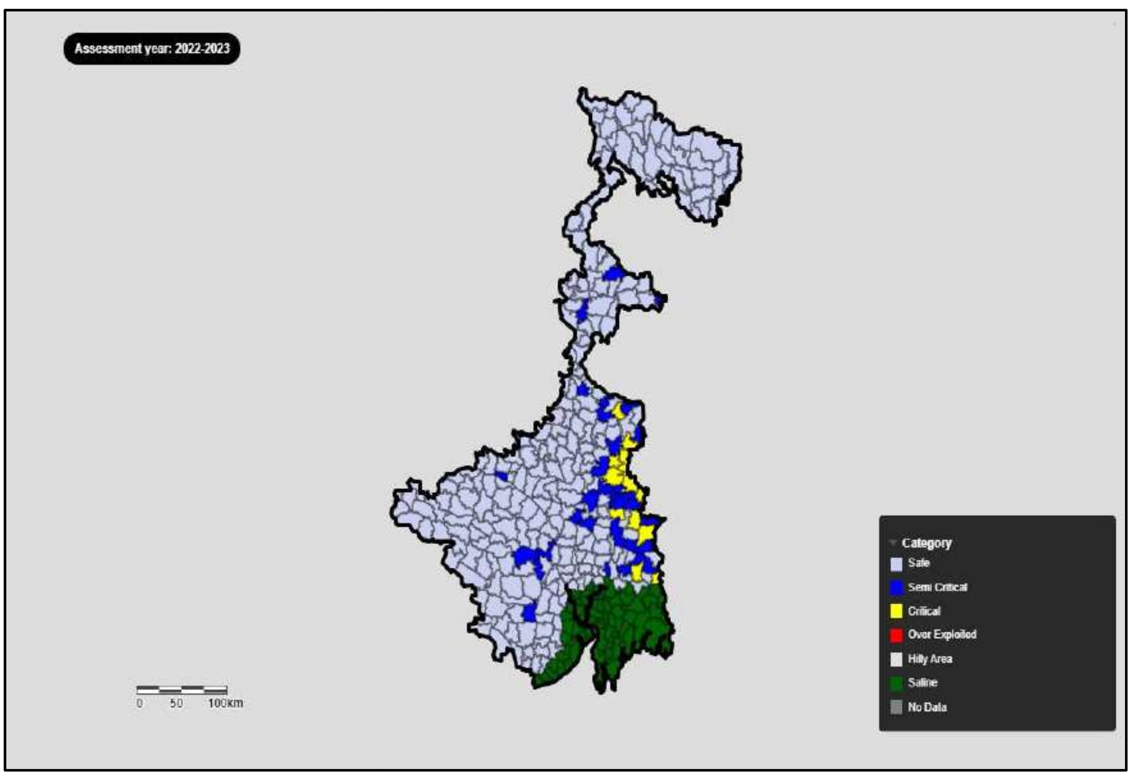
The ground water resource assessment (in 2023) for the State of West Bengal has been carried out as per GEC-2015 guidelines through 'IN-GRES', with blocks as primary assessment units. All 344 blocks of the State of West Bengal and one (01) urban area as Kolkata Municipal Corporation is assessed.. Total Annual Ground Water Recharge has been estimated at 26.29 bcm and Annual Extractable Ground Water Resource has been estimated at 23.9 bcm. Current Annual Ground Water Extraction for all uses has been estimated at 10.71 bcm, which translates into a Stage of Ground Water Extraction at 44.81 %. As per present assessment categorization scheme, out of 345 assessed units, 241 AUs (69.86%) are 'Safe', 32 AUs (9.28%) are 'Semi-Critical', 12 AUs (3.48%) are 'Critical' and 60 AUs (17.39%) are of poor groundwater quality (Saline). There is no Over-Exploited Blocks in the State.

Similarly, out of 79765.77 sq km recharge worthy area of the State, 2737.02 sq km (3.43 %) under 'Critical', 5886.51 sq km (7.38 %) under 'Semi-critical', 61634.14 sq km (77.27 %) under 'Safe' category of assessment units. 9508.1 sq km (11.92%) area is under 'Saline' category of assessment units. Out of total 23900.68 mcm annual extractable ground water resources of the State, 1336.84 mcm (5.59 %) under 'Critical', 2488.15 mcm (10.41 %) under 'Semi-critical' and 20075.68 mcm (84 %) are under 'Safe' categories of assessment units.

As a whole for the State, compared to earlier assessment (2022), Stage of Ground Water Extraction is decreased from 47.01 % to 44.81 % indicating improvement in overall ground water scenario.



Dynamic Ground water Recourses Scenario 2023 – West Bengal



Categorization Map of GWRA 2023 – West Bengal

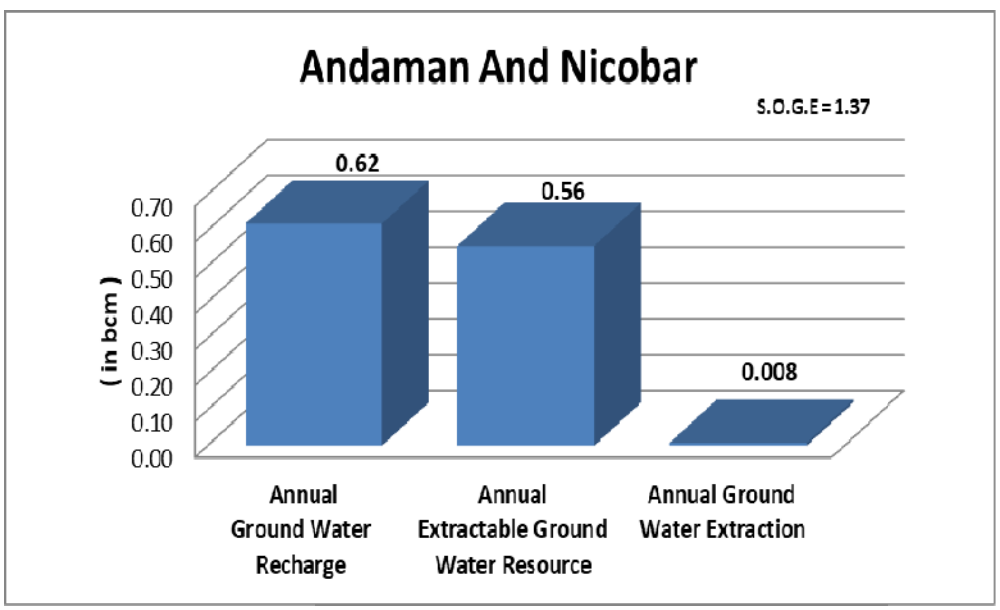
7.30 ANDAMAN AND NICOBAR ISLANDS

Andaman & Nicobar Islands comprise an arc-shaped chain of islands in the Bay of Bengal and are characterized by rugged topography, steep slope, low infiltration capacity and close proximity of hills to the sea. Marine sedimentary group of rocks comprising shale, sandstone, grit and conglomerate; extrusive and intrusive igneous rocks (volcanics and ultramafics) and limestone occupy the entire geographical area. Amongst these, the Sedimentary Group is most pervasive and occupy nearly 70% of the entire area of the islands while the igneous group covers nearly 15% while the rest of 15% goes to the coralline and limestone formations. All these rock formations have been subjected to many tectonic activities, evident from the occurrence of shallow and deep focus earthquakes in the islands.

Marine sedimentary rocks are developed only through dug wells having meager yield of 0.1 to 0.5 lps. The igneous Ophiolite suite of rocks in the area although restricted in occurrence, are observed to yield moderate to high both in shallow and deeper locales and they are developed by dug wells and bore wells with yield ranging from 1 to 10 lps. Area covered by Coralline Limestone contains appreciable quantity of groundwater with yield ranging from 5 to 25 lps.

The Ground Water Resources (in 2023), following GEC 2015 guidelines, have been assessed block-wise. Total Annual Ground Water Recharge of the A&N Islands have been assessed as 0.618 bcm and Annual Extractable Ground Water Resource is assessed as 0.557bcm. The Annual Ground Water Extraction is 0.008 bcm which translates to a Stage of Ground Water Extraction of 1.37 %. Out of 9 assessment units (Blocks), all the assessment units are under 'Safe' category. Similarly, out of 2120.07 sq km recharge worthy area of the UT, the entire recharge worthy area is under 'Safe' category of assessment units and the total 556.96 mcm annual extractable ground water resources of the UT, is under 'Safe' categories of assessment units.

As compared to previous assessment (2022), there is no significant changes in annual ground water recharge, annual extractable groundwater resources, annual groundwater extraction and stage of groundwater extractionin 2023.



Dynamic Ground water Recourses Scenario 2023 – Andaman and Nicobar

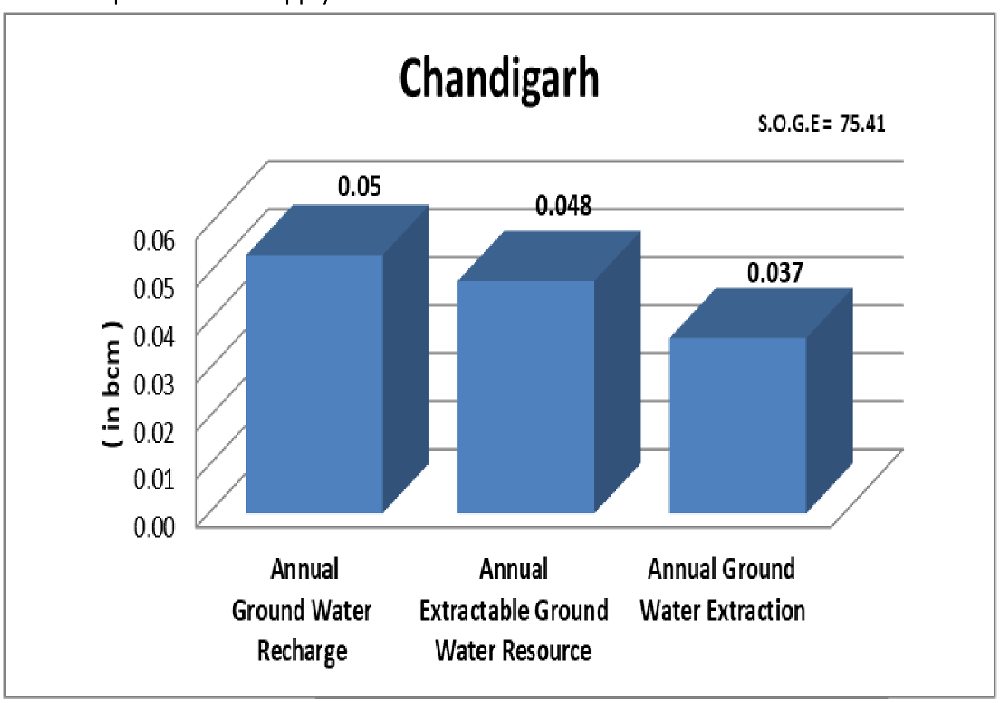
7.31 CHANDIGARH

Chandigarh is underlain by the Quaternary alluvial deposits and comprises layers of fine sand and clay. Coarser sediments occur along the Sukhna Choe and Patialiki Rao, whereas relatively finer sediments underlie the area between these two streams. Fair to good aquifer horizons occur in most part of Chandigarh comprising medium to coarse sand, to a depth of 180 m bgl below which they become finer. Ground water in the area occurs under confined as well as semi-confined conditions. In Manimajra, ground water occurs under unconfined conditions down to about 80 m. In other areas, the semi-confined conditions prevail below 20 to 30 m. The depth of the shallow aquifer system is less than 30 m bgl, where as the depth of the deeper aquifer system ranges from 40 to 450 m bgl of explored depth. The transmissivity values for the deeper aquifer system ranges between 74 and 590 m^2/day. The transmissivity values of shallow aquifers up to 100 m depth ranges from 70 to 466 m^2/day. Ground water is found to be fresh and suitable for drinking as well as irrigation purposes.

UT of Chandigarh has very small area of 114 sq km and whole UT has been taken as an assessment unit. Total Annual Ground Water Recharge has been assessed as 0.054 bcm and Annual Extractable Ground Water Resources as 0.048 bcm. The UT of Chandigarh has been categorized as 'Semi Critical' with Total Extraction of 0.037 bcm and stage of ground water extraction at 75.41 %.

Out of 114 sq km recharge worthy area of the UT, 100 % of the area is under 'Semi-critical'. The entire 48.41 mcm annual extractable ground water resources of the UT, is under 'Semi-critical' categories of assessment units.

In comparison to 2022 assessment, Total annual recharge has increased marginally from 0.05 bcm to 0.054 bcm owing to increased rainfall recharge. The current ground water extraction also decreased minutely from 0.04 bcm to 0.036 bcm due to increased surface water supply. The groundwater extraction in Chandigarh is completely governed by Government and only Government extracts groundwater for public water supply.



Dynamic Ground water Recourses Scenario 2023 - Chandigarh

7.32 DAMAN & DIU AND DADRA & NAGAR HAVELI

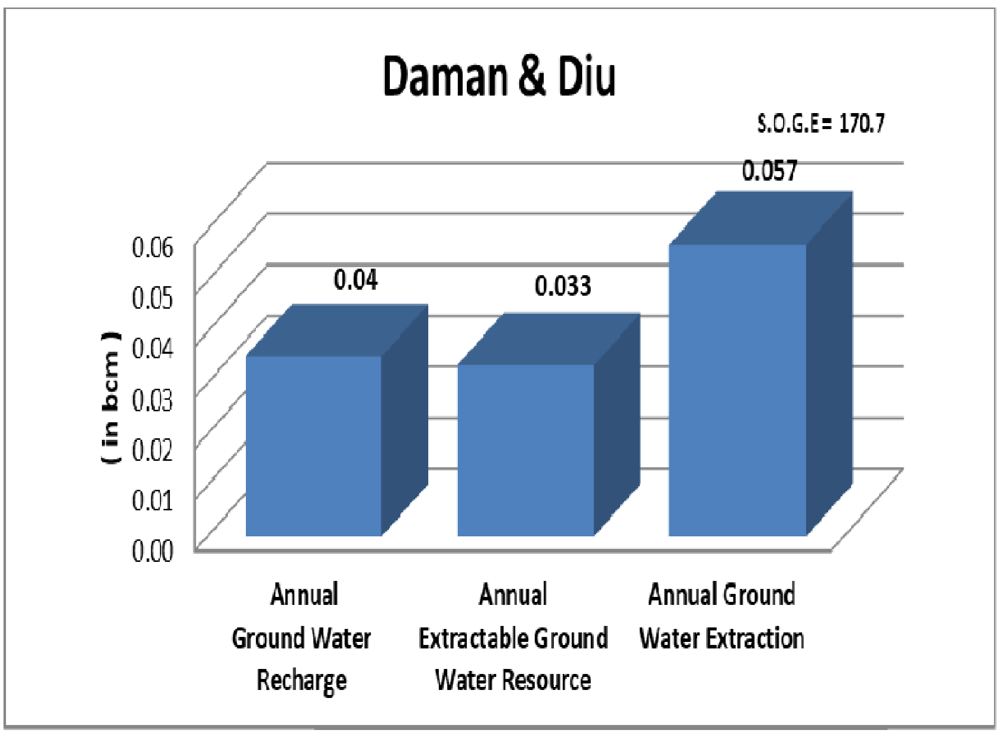
Daman & Diu

The entire island area of Diu is about 40 sq. km and is underlain by Alluvium and Milliolite soft rock formation. The Daman has about 72 sq km area out of which 30 % is covered by alluvium and the rest is underlain by Basalt rocks. In UT of Daman & Diu, dug well as well as dug cum bore wells are common for irrigation and domestic use. The yields of open dug wells varies from less than 1 to 5 m^3/day, where as that of Dug cum Bore wells ranges from less than 2 to 10 m^3/day.

The ground water resources have been assessed district-wise. The total Annual Ground Water Recharge has been assessed as 0.035 bcm and Annual Extractable Ground water Resources as 0.033 bcm. The total current Annual Ground Water Extraction has been assessed as 0.057 bcm and Stage of Ground Water Extraction as 170.7 %. Both Daman and Diu districts are categorized as 'Over Exploited'.

Out of 110.9 sq km recharge worthy area of the UT, the entire area is under 'Over-Exploited'. Total 33.47 mcm annual extractable ground water resources of the UT, 100% is under 'Over-exploited' categories of assessment units.

As compared to 2022 assessment, the annual groundwater recharge has decreased from 0.038 to 0.035 bcm. The annual extractable groundwater resources decreased marginally from 0.036 bcm to 0.033 bcm. Whereas, the annual ground water extraction remains same. The stage of ground water extraction has increased 157.92% to 170.7 %.



Dynamic Ground water Recourses Scenario 2023 – Daman and Diu

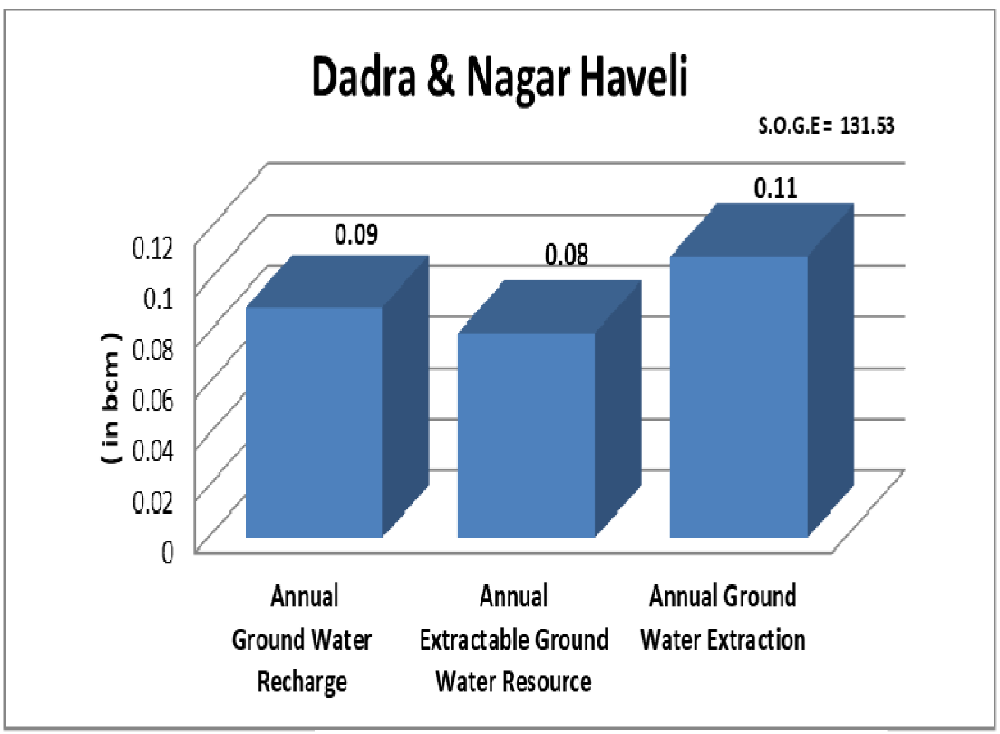
Dadra & Nagar Haveli

The entire area of UT of Dadra and Nagar Haveli is underlain by hard rock terrain (Deccan basalts). The thickness of vesicular units, ranges from 2 to 8 m. Ground water is developed by means of dug wells and dug cum bore wells. The sustainable yield of dug wells for 3 to 4 hours of pumping is 30 m^3/day. The transmissivity of shallow aquifer ranges from 5.5 to 305 m^2/day.

The entire D & NH has been considered as a single assessment unit. Total Annual Ground Water Recharge of the UT of DNH has been assessed as 0.09 bcm and Annual Extractable Ground Water Resources as 0.08 bcm. The Current Annual Ground Water Extraction for all uses is 0.11 bcm and Stage of Ground Water Extraction is 131.53 %. The entire UT of D&NH has been categorized as 'Over Exploited'.

Out of 416 sq km recharge worthy area of the UT, the entire area is under 'Over-Exploited' category. The total 81.71 mcm annual extractable ground water resources of the UT, is under 'Over-exploited' category.

As compared to 2022 estimate, there is no significant change in annual ground water recharge, annual extractable ground water resources and annual ground water extraction. The stage of ground water extraction has decreased marginally from 133.2% to 131.53% in 2023.



Dynamic Ground water Recourses Scenario 2023 – Dadra and Nagar Haveli

7.33 JAMMU & KASHMIR

Jammu & Kashmir Union Territory comprises two Administrative Divisions viz-Jammu, Kashmir with 10 districts each, representing different ground water regimes. In Jammu Region, the ground water occurs in the outer plains (3000 sq km) extending between Munawar Tawi in the north-west to River Ravi in the south-east. The ground water occurs in piedmont deposits belonging to upper Pleistocene to Recent age, comprising unconsolidated sediments in the form of terraces and coalescent alluvial fans developed by the streams debauching out of Siwalik Hills. There are several isolated valleys in the middle Himalayas where ground water occurs in valley fill deposits under unconfined conditions.

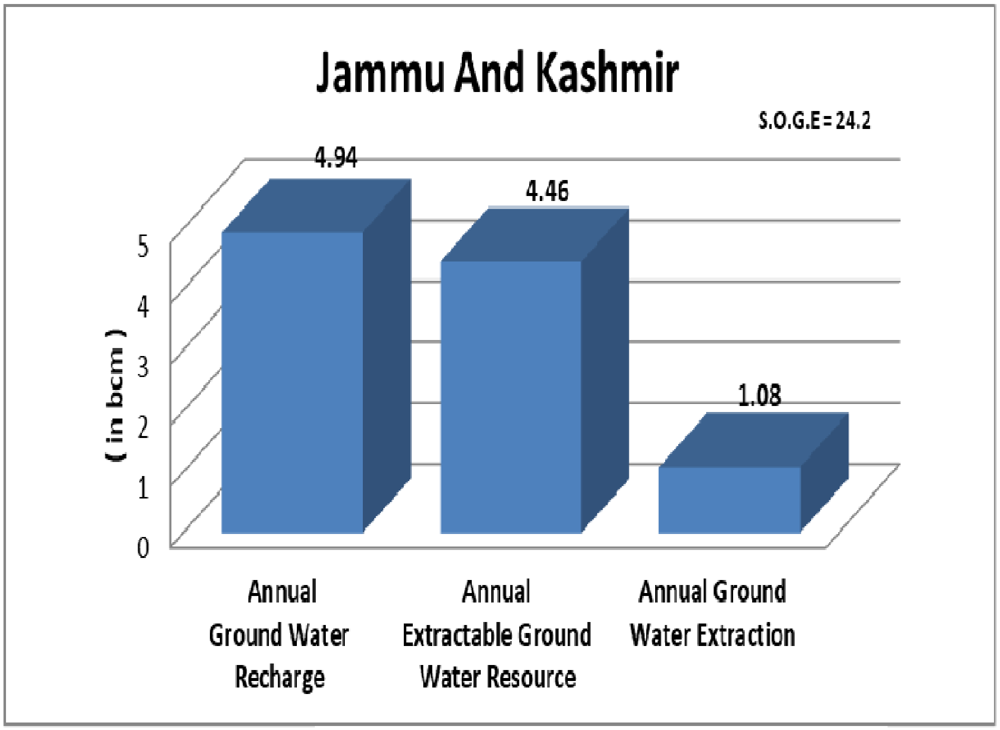
Kashmir valley covers an area of 5600 sq km and is occupied by Karewas which consist of a huge pile of alternating bands of sand, silt, and clay interspersed by glacial boulder beds. The sands are mostly fine to very fine-grained and there is considerable lateral facies variation of sediments with an aggregate thickness of 2500-3000 m. Ground water in the Karewas of Kashmir valley occurs under both confined as well as unconfined conditions.

The Ground water resources of the J&K UT have been assessed for ground water worthy areas and outer plains in 20 districts. These 20 assessment units include the Srinagar urban area (with a population of more than 10 Lakhs). Srinagar Urban Area comprises ground water worthy area of Srinagar district as well as parts of Ganderbal, Baramulla, Budgam, Pulwama and Bandipora districts.

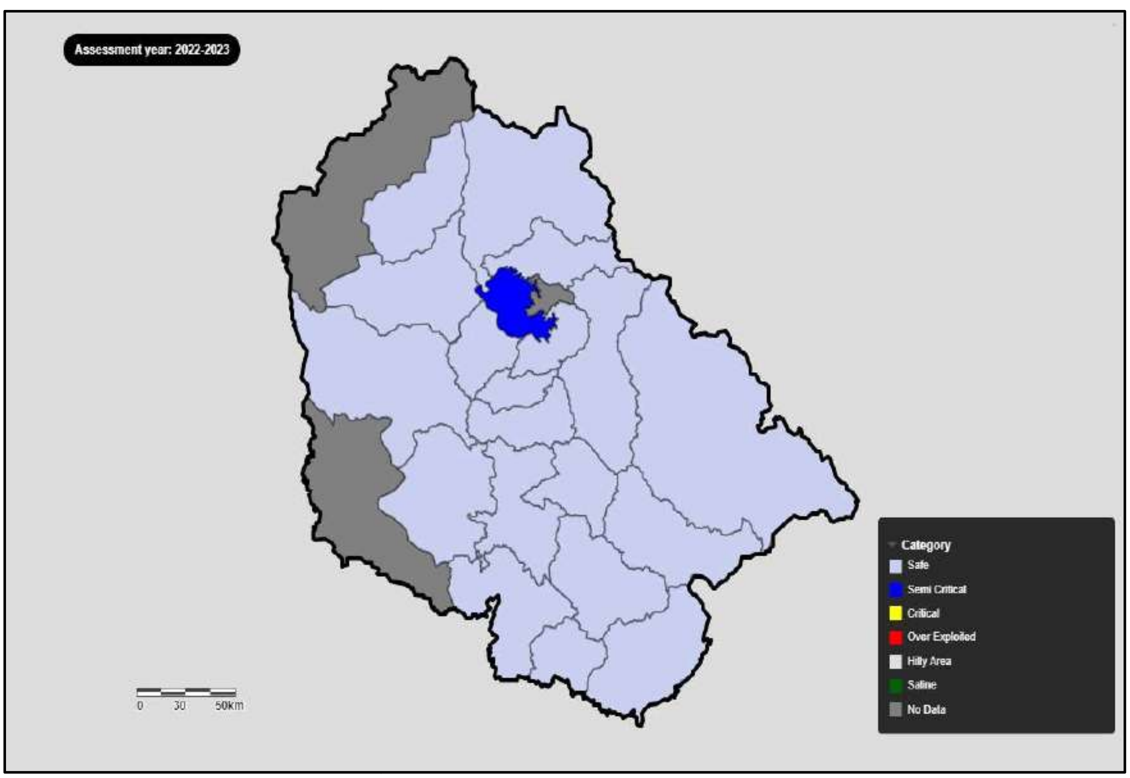
The total Annual Groundwater Recharge of the UT has been estimated as 4.94 bcm and Annual Extractable Ground Water Resources is 4.46 bcm. The Total Current Annual Ground Water Extraction is 1.08 bcm and the Stage of Ground Water Extraction is 24.20 %. Out of 20 assessment units, 19 assessment units have been categorized as ‘Safe’ whereas 1 assessment unit i.e. Srinagar Urban Area comes under the ‘Semi-critical’ category.

Out of 8664.25 sq km recharge worthy area of the State, 875 sq km (10.1 %) under ‘Semi-critical’, 7789.25 sq km (89.9 %) under ‘Safe’ category of assessment units. Out of total 4463.26 mcm annual extractable ground water resources of the State, 104.35 mcm (2.34 %) under ‘Semi-critical’ and 4358.92 mcm (97.66 %) are under ‘Safe’ categories of assessment units.

As compared to the 2022 assessment, the Total Annual Groundwater Recharge and Annual Extractable Ground Water Resources have increased slightly from 4.90 bcm to 4.94 bcm and 4.44 bcm to 4.46 respectively. The Annual Ground Water Extraction has also increased minutely from 1.07 bcm to 1.08 bcm. The Stage of Ground Water Extraction has increased marginally from 24.18 % to 24.20.



Dynamic Ground water Recourses Scenario 2023 – Jammu and Kashmir



Categorization Map of GWRA 2023 – Jammu and Kashmir

7.34 LADAKH

Ladakh Union Territory comprises of two districts viz-Leh and Kargil. The Topography of the region is extremely rugged, mountainous and highly inaccessible. The altitude of the area varies from 3000-8000 m amsl. In Leh district, the Indus and Shyok are the main valleys and the Leh plain, More plain, Hanle Plain, Depsang plain and soda plain are some important plains. Leh plain is underlain by morainic deposits consisting of boulders, cobbles, pebbles embedded in an arenaceous matrix and the lake deposits comprising predominantly of clays, sandy- Clays and silt. The sediments are overlain by varved clays and silts of lacustrine origin again succeeded by morainic boulders and cobbles in disintegrated loose sandy matrix and alluvial deposits. Ground water in the valleys occurs in porous formations. This includes moraines and fluvio-glacial deposits of Ladakh.

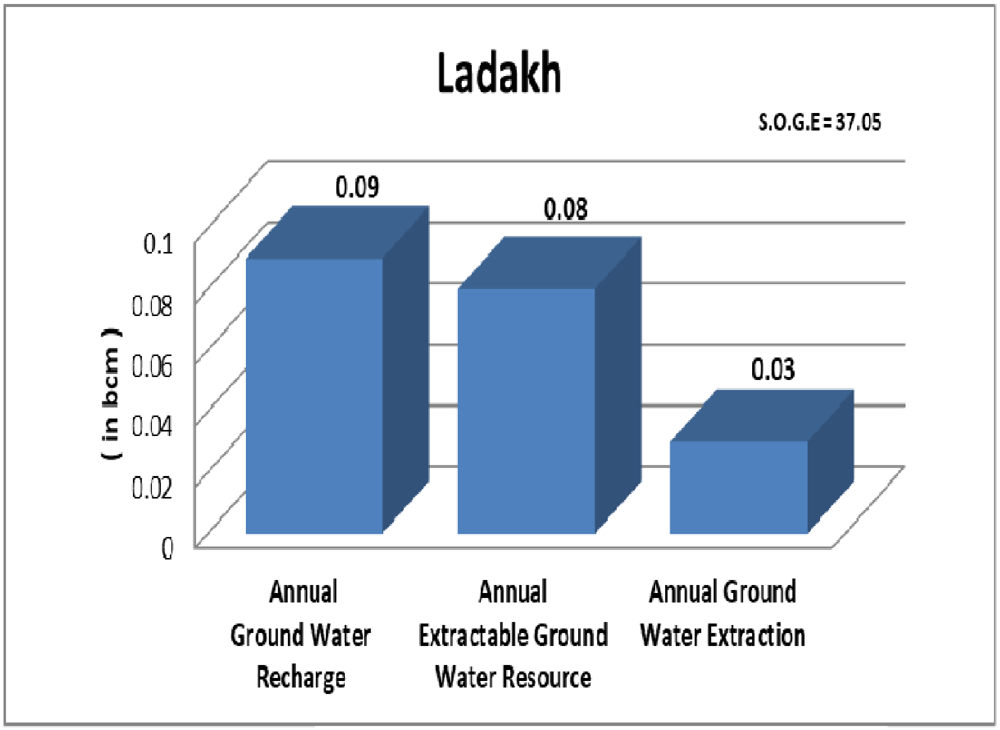
Kargil district comprises of 15 blocks out of which 9 blocks were found ground water recharge worthy areas. Bimbat, Drass, GM Pora, Kargil, Shankoo, Pashkum, Karsha, Zanskar and Shargole blocks are taken as Assessment Units for GWRE 2023.

Similarly, Leh district comprises of 16 blocks out of which 9 blocks were found ground water recharge worthy areas. Diskit, Panamik, Durbuk, Saspol, Nimoo, Leh, Chuchot, Kharu and Thickey are taken as Assessment Units for GWRE 2023. Ground water occurs mainly in the porous formations of morainic deposits comprising of Talus and Scree formations.

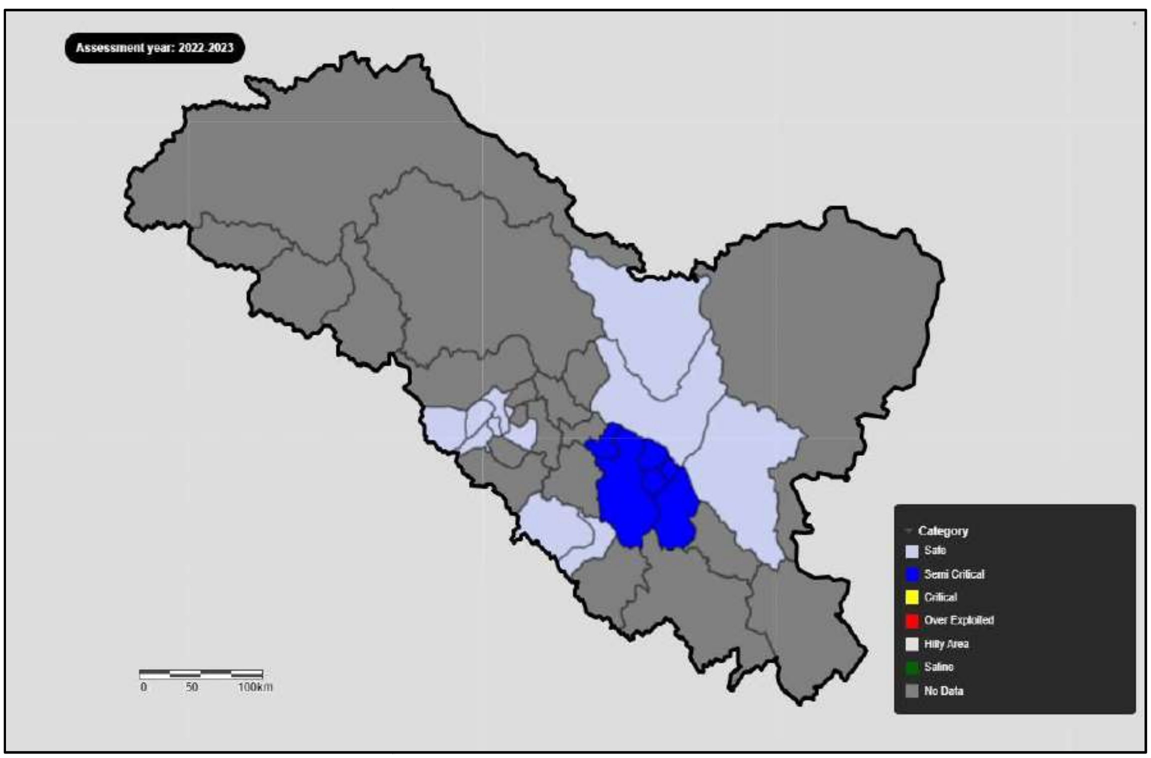
The Ground Water Resources of the Ladakh UT have been assessed for valley areas in 2 districts. The total recharge of ground water involves several components like rainfall/ snowfall being the major one. The other components are seepage from canal, kuhls and return flow from surface water and ground water irrigation. Total Annual Ground Water Recharge of the UT has been estimated as 0.0888 bcm and Annual Extractable Ground Water Resources is 0.0799 bcm. The Total Current Annual Ground Water Extraction is 0.0296 bcm. The Stage of Ground Water extraction in Ladakh is 37.05 %. Out of total 20 Assessment Units, 6 AUs (33.33%) of Leh are categorized as 'Semi Critical' and 12 AUs (66.67%) are categorized as 'Safe'.

Out of 963 sq km recharge worthy area of the UT, 331 sq km (34.37 %) under 'Semi-critical', 632 sq km (65.63 %) under 'Safe' category of assessment units. Out of total 79.97 mcm annual extractable ground water resources of the State, 23.56 mcm (29.46 %) under 'Semi-critical' and 56.41 mcm (70.54 %) are under 'Safe' categories of assessment units.

As compared to the 2022 assessment, the Total Annual Ground Water Recharge and Annual Extractable Ground Water Resources have increased marginally from 0.0813 bcm to 0.0888 bcm and 0.0731 bcm to 0.0799 bcm respectively. The Annual Ground Water Extraction has decreased minutely from 0.0302 bcm to 0.0296 bcm. The Stage of Ground Water Extraction has decreased from 41.36 % to 37.05 %.



Dynamic Ground water Recourses Scenario 2023 - Ladakh



Categorization Map of GWRA 2023 – Ladakh

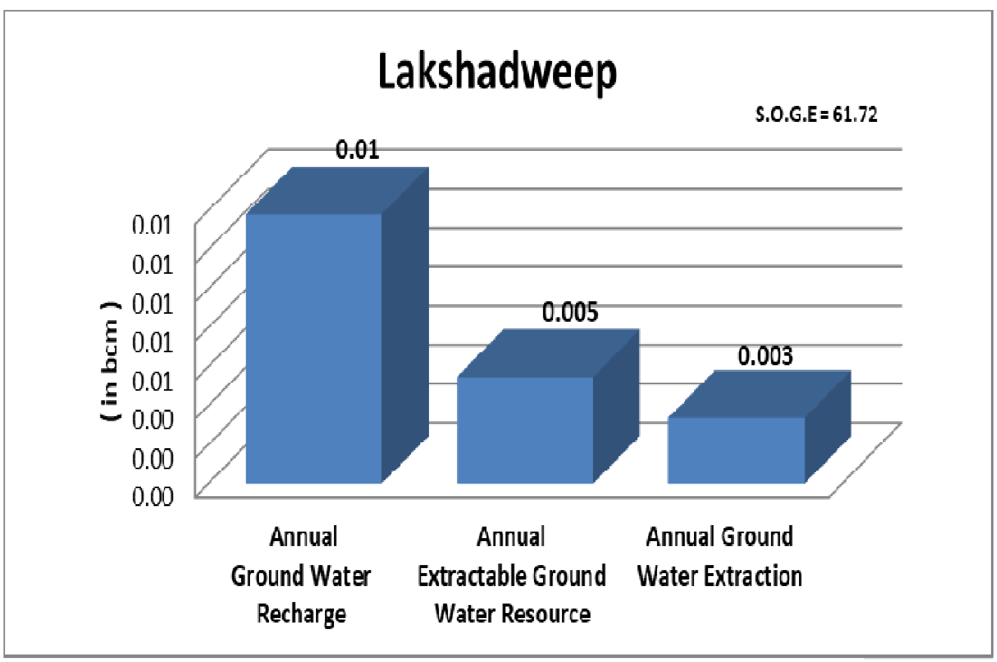
7.35 LAKSHADWEEP

Lakshadweep islands are composed of calcareous sand and materials derived from coral atolls. Alternate layers of loose sand, moderately cemented calc-arenites and well cemented, hard and compact limestone underlie the islands. In these islands, fresh ground water occurs under phreatic conditions as lens floating over the saline water and is in hydraulic continuity with sea water. Water levels in wells are strongly influenced by tides. Dug wells are the common ground water abstraction structures in the islands. The major draft component of these islands is for the domestic consumption. Irrigation draft is negligible in the islands as almost all the crops are rainfed.

Lakshadweep is a unidistrict state wherein the dynamic ground water resources have been assessed for individual islands and the output is generated block wise. The total Annual Ground Water Recharge in the UT has been estimated as 0.013 bcm and Annual Extractable Ground Water Resources works out as 0.0051 bcm. The total current Annual Ground Water Extraction has been assessed as 0.0033 bcm and the Stage of Ground Water Extraction as 61.7%. Out of the 5 assessment units, 4 blocks (80%) are categorized as 'Safe' and 1 block (20%) Kavaratti, as 'Semi Critical'.

Similarly, out of 26.21 sq km recharge worthy area of the State, 6.31 sq km (24 %) under 'Semi-critical', 19.87 sq km (76 %) under 'Safe' category of assessment units. Out of total 5.47 mcm annual extractable ground water resources of the State, 1.335 mcm (24 %) under 'Semi-critical' and 4.135 mcm (76 %) are under 'Safe' categories of assessment units.

As compared to the 2022 assessment, there is no significant changes in the Total Annual Ground Water Recharge, Annual Extractable Ground Water Resources, annual ground water extraction and stage of ground water extraction of the UT in 2023.



Dynamic Ground water Recourses Scenario 2023 - Lakshadweep

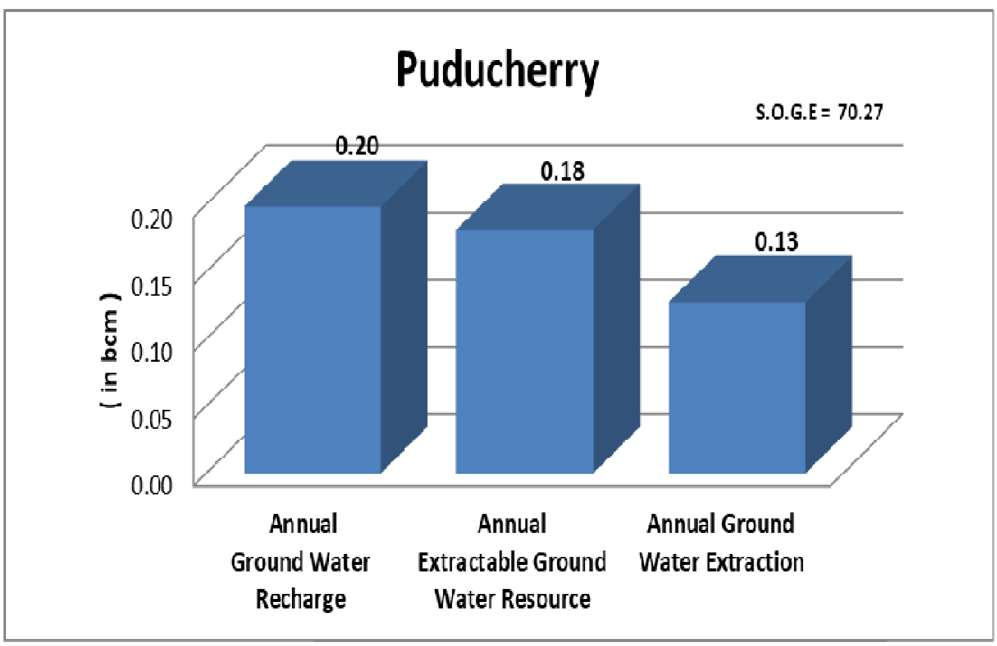
7.36 PUDUCHERRY

The Union Territory of Puducherry is underlain by the semi-consolidated and unconsolidated sedimentary formations, which mainly sustain dug wells, shallow and deep tube wells. The yield of the wells generally varies between 3 to 15 lps. High yielding wells in the range of 10 to 40 lps exists in the Tertiary sandstones.

The Dynamic ground water resources for Union Territory of Puducherry have been assessed Taluk wise i.eOzhukarai, Villianur, Puducherry, Bahour, Mahe and Yanam taluks comes under Puducherry District and Thirunallar and Karaikal taluks comes under Karaikal District. The Annual Ground Water Recharge of the UT of Puducherry has been assessed as 0.198 bcm, Annual Extractable Ground Water Resources is 0.181 bcm and the Annual Ground Water Extraction is 0.127 bcm. The overall Stage of Ground Water Extraction of Union Territory of Puducherry is 70.27 %. Out of 8 taluks assessed, 3 taluks (37.5%) (Mahe, Karaikal &Thirunallar) falls under 'Safe' category, 3 taluks (37.50%) (Ozhukarai, Villianur&Bahour) has been categorized as 'Semi-Critical', 1 taluk (12.50%) (Puducherry) as 'Over-exploited' and 1 taluk (12.50%) (Yanam) as 'Saline'.

Similarly, out of 483 sq km recharge worthy area of the UT, 40.65 sq km (8.42 %) area are under 'Over-Exploited', 252.35 sq km (52.25 %) under 'Semi-critical', 170 sq km (35.20 %) under 'Safe' category of assessment units. 20 sq km (4.14%) area is under 'Saline' category of assessment units. Out of total 180.99 mcm annual extractable ground water resources of the State, 24.06 mcm (13.30 %) are under 'Over-exploited', 116.03 mcm (64.11 %) under 'Semi-critical' and 40.89 mcm (22.59 %) are under 'Safe' categories of assessment units.

As compared to 2022 assessment, there is no significant change in annual ground water recharge, extractable ground water resources & ground water extraction. The Stage of Ground Water Extraction of the UT has increased marginally from 69.17 % to 70.27 %.



Dynamic Ground water Recourses Scenario 2023 – Puducherry

CHAPTER 8

8.0 CONCLUSIONS

Total Annual Ground Water Recharge in the country (2023) has been assessed as 449.08 billion cubic meters (bcm). Ground water resources are replenished through rainfall and other sources like return flow from irrigation, canal seepage, recharge from water bodies, water conservation structures etc. The main source of annual ground water recharge is rainfall, which contributes nearly 60.3% of the Total Annual Ground Water Recharge. The Total Annual Extractable Ground Water Resource of the country has been assessed as 407.21bcm, after keeping a provision for natural discharge. The Annual Ground Water Extraction of the country (2023) is 241.34bcm, the largest user being irrigation sector, which accounts for 87% of the total annual groundwater extraction. The Stage of ground water extraction for the entire country, which is the percentage of ground water extraction with respect to Annual Extractable Ground Water Recharge, has been computed as 59.26%. The extraction pattern of ground water is not uniform across the country, resulting in ground water stressed conditions in some parts of the country while in some other areas; ground water extraction has been sub- optimal. Out of the total 6553assessment units (Blocks/ Districts/ Mandals/ Talukas) in the country, 736units (11.23%) have been categorized as 'Over-Exploited', 199units (3.04%) have been categorized as 'Critical', 698units (10.65%) have been categorized as 'Semi-Critical' and 4793units (73.14%) have been categorized as 'Safe'. Apart from this, there are 127assessment units (1.94%), which have been categorized as 'Saline' as major part of the ground water in phreatic aquifers is brackish or saline. Similarly out of 24.64 lakh sq km recharge worthy area of the country, 4.18lakh sq km (16.95%) are under 'Over-Exploited', 0.86 lakh sq km (3.49 %) are under 'Critical', 2.92 lakh sq km (11.85%) are under 'Semi-Critical', 16.30 lakh sq km (66.15 %) are under 'Safe' and 0.38lakh sq km (1.55%) are under 'Saline' category assessment units. Out of 407.21bcm of Total Annual Extractable Resources of the country, 45.12bcm (11.08%) are under 'Over-Exploited', 12.91 bcm (3.17%) are under 'Critical', 47.37bcm (11.63%) are under 'Semi-Critical', 301.80 bcm (74.11%) are under 'Safe' category assessment units.

Over-exploitation of ground water resources could be due to various region-specific reasons. Assessment units located in the north-western part of the country (particularly in the states of Punjab, Haryana, Delhi and Uttar Pradesh) have plenty of replenishable ground water resources but because of the over extraction beyond the annual ground water recharge, many of these units have become Over-exploited. Over-exploited units are also common in the western part of the country, particularly in Rajasthan and Gujarat where the prevailing arid climate results in low recharge of ground water and hence stress on these source. In peninsular India, over-exploited units are wide spread in the states of Karnataka, Tamil Nadu and parts of Andhra Pradesh and Telangana which could be attributed mainly to the low storage and transmission capacities of aquifers of the hard rock terrains, which results in reduced availability of the resource.

The total Annual Ground Water Recharge for the entire country, as in 2023 has increased by 11.48bcm as compared to the last assessment (2022). The total Annual Extractable GW Resources has also increased by 9.13bcm. The Annual Ground Water Extraction for irrigation, domestic and Industrial uses has also increased by 2.18 bcm during this period. These variations are attributed mainly to refinement of parameters, refinement in well census data and changing ground water regime.The Stage of Ground Water Extraction of the Country has decreased from 60.08% to 59.26%.

It is also pertinent to add that as it is advisable to restrict the ground water extraction as far as possible to annual replenishable resources, the categorization also reflects the relation between the annual replenishment and ground water extraction.

GEC-2015 methodology has been developed for prevalent Indian conditions, on the basis of terrain characteristics and data availability. "INDIA-GROUNDWATER RESOURCE ESTIMATION SYSTEM (IN-GRES) is a Software/Web-based Application developed by CGWB in collaboration with IIT-Hyderabad. It provides common and standardized platform for Ground Water Resource Estimation for the entire country and its pan-India operationalization (Central and State Governments). The system take'Data Input' through Excel as well as Forms, compute various ground water components (recharge, extraction etc.) and classify assessment units into appropriate categories (safe, semi-critical, critical and over-exploited). The Software uses GEC 2015 Methodology for estimation and calculation of Groundwater resources. It allows for unique and homogeneous representation of groundwater fluxes as well as categories for all the assessment units (AU) of the country.

An analysis of assessment results leads us to the following inferences as the way forward in the assessment of Ground water resources.

8.1 WATER BALANCE STUDIES

Ground water is one of the several components of the Hydrologic Cycle, other important components being rainfall, surface water, soil moisture and evapotranspiration. Holistic water resources management interventions require proper understanding of the interactions between the different components of the hydrosphere. Studies for determining the Base flow and lateral flow components in the Water Balance equation need to be taken up to bring more accuracy to the Ground water Resources Assessment. Initially, the number of such studies can be taken up in areas representing different hydrogeological set up of India (Southern hard rock terrain, Deccan Basaltic terrain, Indo-Gangetic and Brahmaputra alluvial plains, Coastal alluvium, Desert terrain and Himalayan terrain etc.)

8.2 AQUIFER CHARACTERIZATION AND PARAMETER ESTIMATION

One of the key elements that determine the accuracy of ground water resources assessment is the realistic estimation of the recharge and discharge parameters. It is recommended that more experimental studies be taken up for refining the norms of RIF, return flow from irrigation based on soil types and agro-climatic zone, recharge from water conservation and water bodies and more field studies for evaluation of specific yield values as well as its variation with depth.

8.3 CASE STUDIES LINKING ASSESSMENT WITH MANAGEMENT

It is recommended to take up case studies in various assessment units wherein quantitative evaluation of the ground water management interventions and consequent changes in the assessment results could be analysed. Such studies would help bring out the efficacy of various management interventions on the ground water regime.

8.4 TEMPORAL AVAILABILITY OF GROUND WATER RESOURCES

Even though the GEC 2015 methodology advocates season-wise resource assessment, the estimation of recharge during monsoon and non-monsoon seasons may not be sufficient. Temporal variations in groundwater availability, particularly in hard rock terrain are not reflected in present practices. Hence, the assessment of temporal availability of ground water resources on the basis of available water columns can be attempted by considering the water levels measured frequently using Digital Water Level Recorders (DWLRs).

8.5 CREATION OF DATABASE FOR GROUND WATER RESOURCES ASSESSMENT AND ITS REGULAR UPDATING

GEC 2015 has devised the data structure of all the data elements (like water level, rainfall etc) and norms (like Specific Yield, Rainfall Infiltration Factor etc.) with its name, type of data and its precision. The templates (excel sheets) for data collection/compilation for assessment through IN-GRES using GEC 2015 has also been devised. However, major challenges are lack of dedicated manpower as well as presence of State GW/Nodal Departments (in majority of States) at District level for understanding/analysis of data/information to be collected/compiled from different State Departments (like Agriculture, Irrigation, Water Supply, Industries, Water Conservation etc.). Of particular importance in this regard are data/information related to recharge from water bodies, water conservation/harvesting structures, return flow from applied irrigation and details of ground water extraction structures in use for irrigation, domestic and industrial purpose. These need to be collected/compiled and regularly updated at district/block level so that more realistic assessment of ground water resources could be accomplished.

8.6 AQUIFER-WISE ASSESSMENT WITHIN THE PRESENT ADMINISTRATIVE UNITS (ASSESSMENT UNITS) IN AREAS OTHER THAN HARD ROCK TERRAIN

Areas occupied by unconsolidated sediments (alluvial deposits, aeolian deposits, coastal deposits etc.) usually have flat topography and assessment of ground water resources has been carried out taking administrative units (block/mandal/taluk etc.) as assessment units to facilitate the local administration in planning the ground water management programmes (both supply and demand side). However, if more than one hydrogeological/aquifer units (with distinctive characteristics, sustainability and ground water extraction patterns) exist within these administrative units, then the assessment units could be further divided into smaller units based on hydrogeological/aquifer characteristics. This will lead to more accurate assessment (aquifer wise) of resources and micro-level/area-specific interventions/management measures could be implemented.

8.7 GROUND WATER ASSESSMENT OF DEEPER AQUIFER SYSTEMS IN INDO-GANGETIC, BRAHMAPUTRA AND COASTAL ALLUVIAL TERRAIN

The dynamic ground water resources mainly comprises ground water resources available within the zone of water table fluctuation which are being regularly replenished every year through rainfall and other sources of recharge. This assessment has been carried out and categorization done based on utilization with respect to annual availability of dynamic ground water resources. However, in Indo-Gangetic, Brahmaputra and Coastal Alluvial areas multiple aquifer systems exist (on a regional scale) with sustainable and high yield characteristics. For assessment of deeper aquifers, more studies on individual aquifer potential/sustainable yield along with facilities for monitoring of piezometric heads (by establishing piezometers tapping different aquifer zones) have to be carried out. The resources of deeper aquifer systems could be considered for extraction during exigencies as well as for drinking water purpose for nearby regions.

8.8 AQUIFER-STREAM INTERACTIONS

Additional studies on aquifer-stream interactions are required to understand the contribution of ground water to streams and the requirement of environmental flows for sustainability of water resources and surrounding ecosystem.

8.9 GROUND WATER MODELLING AND PREDICTIVE SIMULATION

Besides the assessment of the dynamic ground water resources using norms prescribed in GEC 2015 methodology through automation, the concept of Ground water modelling must be included where predictive simulation can also be done. This would give an idea of the future availability of Ground water resources with respect to the changing climate and extraction patterns.

ANNEXURE - I

State-wise Ground Water Resources Availability, Utilization and Stage of Extraction

(as in 2023)

STATE-WISE GROUND WATER RESOURCES OF INDIA, 2023

(in bcm)

S. No.	States / Union Territories	Ground Water Recharge: Monsoon Season: Recharge from rainfall	Ground Water Recharge: Monsoon Season: Recharge from other sources	Ground Water Recharge: Non-monsoon Season: Recharge from rainfall	Ground Water Recharge: Non-monsoon Season: Recharge from other sources	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction: Irrigation	Current Annual Ground Water Extraction: Industrial	Current Annual Ground Water Extraction: Domestic	Current Annual Ground Water Extraction: Total	Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Andhra Pradesh	8.97	9.94	0.85	8.08	27.83	1.39	26.45	6.44	0.14	0.9	7.48	1.25	19.09	28.3
2	Arunachal Pradesh	2.11	0.66	1.06	0.81	4.65	0.49	4.16	0.01	0.0003	0.01	0.02	0.01	4.15	0.42
3	Assam	19.29	0.81	6.53	0.63	27.26	6.32	20.93	2.06	0.01	0.55	2.63	0.58	18.27	12.54
4	Bihar	20	7.72	1.14	5.11	33.96	3.24	30.72	10.13	0.37	3.26	13.75	3.48	17.02	44.76
5	Chhattisgarh	8.39	2.24	0.23	2.49	13.34	1.16	12.18	4.87	0.13	0.75	5.75	0.83	6.51	47.17
6	Delhi	0.08	0.09	0.04	0.17	0.38	0.04	0.34	0.08	0.0007	0.26	0.34	0.28	0.03	99.13
7	Goa	0.356	0.008	0.003	0.029	0.396	0.079	0.317	0.025	0.005	0.038	0.068	0.040	0.247	21.37
8	Gujarat	19.49	2.75	0.00	5.12	27.35	1.95	25.41	12.13	0.17	0.84	13.13	0.80	12.86	51.68
9	Haryana	3.18	2.87	0.63	2.87	9.55	0.86	8.69	10.55	0.62	0.62	11.8	0.64	1	135.74
10	Himachal Pradesh	0.62	0.18	0.13	0.19	1.11	0.1	1.01	0.18	0.05	0.12	0.35	0.12	0.66	34.95
11	Jharkhand	4.96	0.46	0.46	0.37	6.25	0.52	5.73	0.94	0.21	0.65	1.8	0.65	3.95	31.38
12	Karnataka	9.22	4.95	1.12	3.64	18.93	1.85	17.08	10.09	0.13	1.1	11.32	1.18	7.29	66.26
13	Kerala	4.09	0.14	0.44	0.85	5.53	0.52	5.01	1.12	0.01	1.59	2.73	2.19	2.02	54.55
14	Madhya Pradesh	26.94	1.62	0.13	6.78	35.47	2.62	32.85	17.4	0.17	1.72	19.3	1.88	14.45	58.75
15	Maharashtra	20.74	2.62	0.64	8.76	32.76	1.82	30.95	15.28	0.03	1.36	16.66	1.42	14.81	53.83
16	Manipur	0.4	0.001	0.11	0.006	0.52	0.05	0.47	0.017	0.0002	0.02	0.04	0.02	0.42	7.99
17	Meghalaya	1.32	0.05	0.42	0.04	1.83	0.32	1.51	0.02	0.0003	0.04	0.07	0.05	1.43	4.58
18	Mizoram	0.19	0	0.03	0	0.22	0.02	0.2	0	0	0.01	0.01	0.01	0.19	3.70
19	Nagaland	0.4	0.12	0.08	0.0039543	0.6	0.06	0.54	0.00227	0.00002	0.02	0.02	0.02	0.52	3.76
20	Odisha	10.19	2.89	1.51	2.76	17.35	1.41	15.94	5.96	0.18	1.25	7.39	1.37	8.49	46.33
21	Punjab	4.72	9.07	0.72	4.33	18.84	1.87	16.98	26.39	0.24	1.18	27.8	1.19	1.82	163.76
22	Rajasthan	9.01	0.64	0.19	2.6	12.45	1.2	11.25	14.3	0.13	2.31	16.74	2.31	0.9	148.77
23	Sikkim	0.166	0.004	0.073	0.000	0.243	0.024	0.219	0.009	0.001	0.002	0.012	0.002	0.206	5.54
24	Tamil Nadu	7.26	10.36	1.30	2.66	21.59	2.10	19.51	13.48	0.15	0.79	14.42	1.47	6.86	73.91
25	Telangana	7.15	7.43	1	7.55	23.14	2.22	20.92	7.24	0.35	0.49	8.09	0.7	12.83	38.65
26	Tripura	0.81	0.16	0.32	0.07	1.36	0.26	1.09	0.03	0.0003	0.08	0.11	0.09	0.98	9.92
27	Uttar Pradesh	35.72	14.01	0.78	21.32	71.83	6.26	65.57	40.92	0.44	5.04	46.4	5.42	20.04	70.76
28	Uttarakhand	1.31	0.29	0.1	0.32	2.02	0.17	1.85	0.67	0.12	0.17	0.95	0.17	0.89	51.69
29	West Bengal	16.91	1.71	3.54	4.13	26.29	2.39	23.9	8.99	0.15	1.57	10.71	1.77	13.07	44.81
30	Andaman And Nicobar	0.298	0.0002	0.320	0.0001	0.618	0.062	0.557	0.0001	0.001	0.007	0.008	0.007	0.549	1.37
31	Chandigarh	0.010	0.014	0.003	0.027	0.054	0.005	0.048	0.008	0.002	0.026	0.037	0.026	0.012	75.41
32	Dadra & Nagar Haveli	0.06	0.01	0.03	0.02	0.09	0.01	0.08	0.01	0.09	0.01	0.11	0.02	0.01	131.53
	Daman & Diu	0.03	0.001	0	0.001	0.035	0.002	0.033	0.003	0.055	0	0.057	0.016	0	170.70
33	Jammu And Kashmir	1.17	1.94	1.18	0.64	4.94	0.47	4.46	0.32	0.05	0.71	1.08	0.73	3.36	24.20
34	Ladakh	0.01	0.05	0.02	0	0.09	0.01	0.08	0	0.0002	0.03	0.03	0.03	0.05	37.05
35	Lakshadweep	0.011	0.00001	0.003	0.000	0.014	0.008	0.005	0.00	0.00	0.003	0.003	0.003	0.002	61.723
36	Puducherry	0.05	0.09	0.01	0.04	0.20	0.02	0.18	0.07	0.01	0.05	0.13	0.05	0.05	70.27
	Grand Total	**245.63**	**85.89**	**25.15**	**92.42**	**449.08**	**41.89**	**407.21**	**209.74**	**4.01**	**27.57**	**241.34**	**30.82**	**195.03**	**59.26**

Note-For National compilation, Evapotranpiration loss of Arunanchal Pradesh, Assam, Meghalaya, Tripura and Lakshadweep has been added in Total Natural Discharges.

ANNEXURE - II

District-wise Ground Water Resources Availability, Utilization and Stage of extraction

(as in 2023)

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023

ANDHRA PRADESH

S. No.	Name of District	Ground Water Recharge: Monsoon Season: Recharge from rainfall	Ground Water Recharge: Monsoon Season: Recharge from other sources	Ground Water Recharge: Non-monsoon Season: Recharge from rainfall	Ground Water Recharge: Non-monsoon Season: Recharge from other sources	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction: Irrigation	Current Annual Ground Water Extraction: Industrial	Current Annual Ground Water Extraction: Domestic	Current Annual Ground Water Extraction: Total	Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Alluri Sitharama Raju	39712.55	45159.92	3606.24	5041.66	93520.37	4676.52	88843.85	577.32	0.00	1629.76	2208.25	1810.56	86679.17	2.49
2	Anakapalli	23022.41	36881.47	14099.21	6139.20	80142.29	4007.53	76134.74	14953.87	472.55	4898.55	20325.18	5764.06	55762.90	26.70
3	Ananthapuramu	41549.90	43716.95	641.38	37402.50	123310.73	6165.78	117144.95	34880.78	515.59	3588.93	38985.56	4733.85	77496.92	33.28
4	Annamayya	46543.94	20448.06	712.98	21346.88	89051.86	4452.72	84599.14	37917.89	137.75	3372.71	41428.40	5013.91	41865.79	48.97
5	Bapatla	23564.31	36845.21	1344.37	13371.33	75125.22	3756.29	71368.93	10900.62	55.24	2689.97	13645.89	2820.74	57813.38	19.12
6	Chittoor	58261.29	14840.54	1246.99	18816.39	93165.21	4658.55	88506.66	44292.62	1330.25	4042.46	49665.36	5847.33	37894.67	56.11
7	East Godavari	24044.94	46936.69	2492.67	38704.40	112178.70	5608.97	106569.74	28398.39	1155.12	2082.54	31636.01	2199.24	76735.16	29.69
8	Eluru	50871.81	76454.98	1620.74	37091.46	166038.99	8302.18	157736.81	40417.18	460.80	10085.37	50962.97	11458.47	107732.99	32.31
9	Guntur	10346.15	22526.88	4321.07	20783.20	57977.30	2898.92	55078.38	7902.72	209.65	2539.92	10652.25	2788.24	44177.74	19.34
10	Kakinada	16335.84	54048.29	3403.86	28783.29	102571.28	5091.13	97480.11	12460.61	2577.66	2085.56	17123.50	2191.45	80510.19	17.57
11	Konaseema	16267.90	48963.66	2068.18	46064.06	113363.80	5668.18	107695.61	14987.84	1026.65	1266.12	17280.41	1327.73	90449.81	16.05
12	Krishna	23700.04	90011.45	4196.69	82260.96	200169.14	10008.60	190160.54	45685.31	994.54	2061.21	48741.05	2736.07	140744.63	25.63
13	Kurnool	37888.27	22869.19	566.53	15764.23	77088.22	3854.52	73233.70	11879.53	59.85	5277.86	17217.31	5464.97	55888.49	23.51
14	Ntr	20116.16	31641.94	1211.81	19833.50	72803.41	3640.28	69163.13	20579.11	1137.84	1551.26	23268.31	1609.86	46002.42	33.64
15	Nandyal	22411.99	52414.99	66.46	31552.10	106445.54	5322.58	101122.96	13322.30	128.40	503.11	13953.09	503.56	87169.87	13.80
16	Palnadu	17343.91	54608.72	9426.81	18922.04	100301.48	5015.04	95286.44	24219.34	81.63	4268.45	28569.56	4393.82	68662.11	29.98
17	Parvathipuram Manyam	30690.48	36721.59	3665.57	23402.99	94480.63	4724.50	89756.13	17827.11	12.96	1765.96	19605.87	2330.08	71187.33	21.84
18	Prakasam	60916.02	17698.69	994.24	11118.63	90727.58	4415.71	86143.71	23626.02	469.79	3859.60	27955.73	4215.74	58666.08	32.45
19	Sri Potti Sriramulu Nellore	67647.31	52262.93	20210.82	118510.33	258631.39	12931.68	245699.72	57334.73	987.25	5701.42	64023.96	9682.58	179473.61	26.06
20	Sri Sathya Sai	43246.69	31270.86	595.26	42917.36	118030.17	5901.67	112128.50	54079.04	121.32	8856.86	63057.16	11119.93	56121.97	56.24
21	Srikakulam	34392.16	37913.88	2560.80	14338.22	89205.06	4460.36	84744.69	23277.56	259.20	4711.98	28248.35	15250.62	60358.34	33.33
22	Tirupati	81649.20	22032.16	87.94	56115.77	159885.07	7994.30	151890.77	39727.84	1439.05	3788.32	44955.90	8646.84	106732.50	29.60
23	Visakhapatnam	8503.85	3256.51	847.80	1076.53	13684.69	684.40	13000.29	2878.65	50.52	2407.96	5337.18	3184.22	7077.33	41.05
24	Vizianagaram	30432.86	48264.79	4077.59	45923.58	128698.82	6435.44	122263.28	26120.16	131.52	2039.23	28290.90	4185.77	94569.55	23.14
25	West Godavari	12605.49	23343.68	235.36	24001.68	60186.21	3009.35	57176.86	5734.47	101.52	447.04	6282.88	1118.19	50222.81	10.99
26	Y.S.R Kadapa	54542.18	23120.53	539.58	28810.11	107012.40	5350.79	101661.60	29760.06	390.31	4264.09	34414.49	4264.09	68869.94	33.85
	Total(Ham)	**896607.65**	**994254.56**	**84840.95**	**808092.40**	**2783795.56**	**139035.99**	**2644591.24**	**643741.06**	**14306.96**	**89786.25**	**747835.5**	**124661.92**	**1908865.70**	**28.30**
	Total(Bcm)	**8.97**	**9.94**	**0.85**	**8.08**	**27.83**	**1.39**	**26.45**	**6.44**	**0.14**	**0.90**	**7.48**	**1.25**	**19.09**	**28.30**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
ARUNACHAL PRADESH															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	CHANGLANG	16679.04	23267.1	7569.09	29705.68	77220.91	7722.08	69498.83	154.16	0	177.52	331.68	188.4	69156.28	0.48
2	EAST KAMENG	8567.56	1766.35	3180.99	2259	15773.9	1577.39	14196.51	166.1	0	14	180.09	16.26	14014.15	1.27
3	EAST SIANG	58602.28	5556.8	14046.82	7098.03	85303.93	8829.64	76474.29	178	0	62.93	240.93	65.66	76230.64	0.32
4	LOHIT	62562.81	3416.79	41934.2	4365.45	112279.25	10561.55	101717.7	139.5	8.4	224.75	372.65	237.07	101332.73	0.37
5	LOWER DIBANG VALLEY	41521.92	5011.42	32545.92	6400.16	85479.42	8547.94	76931.48	114.84	0	31.21	146.05	31.9	76784.74	0.19
6	LOWER SUBANSIRI	2475.32	516.76	1442.42	661.56	5096.06	675.27	4420.79	76.85	0	21.62	98.46	26.71	4317.24	2.23
7	PAPUM PARE	8131.72	5784.91	2332.98	7387.61	23637.22	4876.35	18760.87	100.76	29.4	102.08	232.25	123.14	18507.56	1.24
8	TIRAP	5952.27	190.74	1658.41	243.84	8045.26	804.52	7240.74	16.6	0	48.31	64.92	50.06	7174.07	0.9
9	UPPER SUBANSIRI	141.52	7558.08	73.65	6434.4	14207.65	1420.76	12786.89	19.36	0	3.51	22.87	4.39	12763.14	0.18
10	WEST KAMENG	2342.96	7081.88	397.31	9040.8	18862.95	1886.31	16976.64	4.64	0	11.28	15.91	11.73	16960.29	0.09
11	WEST SIANG	4445.28	6091.03	916.74	7776.36	19229.41	1922.95	17306.46	23.5	1.18	2.34	27.02	2.4	17279.38	0.16
	Total(Ham)	**211422.68**	**66241.86**	**106098.53**	**81372.89**	**465135.96**	**48824.76**	**416311.2**	**994.31**	**38.98**	**699.55**	**1732.83**	**757.72**	**414520.22**	**0.42**
	Total(Bcm)	**2.11**	**0.66**	**1.06**	**0.81**	**4.6513596**	**0.4882476**	**4.16**	**0.01**	**0.0003**	**0.01**	**0.02**	**0.01**	**4.15**	**0.42**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
ASSAM															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	BAKSA	113860.77	6773.38	27266.79	10880.85	158781.79	18300.92	140480.87	2555.28	3.16	1976.51	4534.95	2042.59	135879.84	3.23
2	BARPETA	59076.65	5655.03	22901.18	3527.78	91160.64	13561.87	77598.77	24373.44	13.12	3923.74	28310.31	4218.97	48993.23	36.48
3	BONGAIGAON	35859.3	2572.17	12847.54	2897.03	54176.04	9642.23	44533.81	10153.92	5.5	1648.34	11807.74	1766.22	32608.18	26.51
4	CACHAR	61596.25	2250.95	23182.18	2896.86	89926.24	48305.57	41620.67	1.68	30.77	1390.76	1423.19	1487.81	40100.42	3.42
5	CHIRANG	83302.01	1238.32	25347.61	138.24	110026.18	12774.13	97252.05	1518.72	4.82	936.84	2460.4	970.07	94758.42	2.53
6	DARRANG	39107.46	1500.03	14212.77	1052.21	55872.47	5468.56	50403.91	15523.2	56.52	2076.81	17656.55	2240.22	32583.95	35.03
7	DHEMAJI	97864.5	302.56	38007	67.08	136241.14	45842.64	90398.5	3089.52	7.07	1486.17	4582.78	1588.46	85713.43	5.07
8	DHUBRI	82267.94	4434.97	18117.49	5088.98	109909.38	11577.76	98331.62	23600.64	2.73	4578.26	28181.64	4986.54	69741.69	28.66
9	DIBRUGARH	109264.86	2133.21	37792.02	1121.99	150312.08	25536.56	124775.52	5633.04	82.53	2662.21	8377.76	2761.88	116298.08	6.71
10	DIMA HASAO	43723.76	144.95	19071.65	18.92	62959.28	6295.92	56663.36	336	1.19	233.6	570.79	243.95	56082.23	1.01
11	GOALPARA	57452.16	2096.57	19326	2265.11	81139.84	22484.11	58655.73	9972.48	41.85	2410.11	12424.43	2604.68	46036.72	21.18
12	GOLAGHAT	77427.93	1421.46	29903.35	856.9	109609.64	12614.02	96995.62	3833.76	129.65	1973.04	5936.47	2052.65	90979.54	6.12
13	HAILAKANDI	19091.47	1478.02	9513.41	340.65	30423.55	9547.58	20875.97	5.04	0	527.22	532.27	566.95	20303.97	2.55
14	JORHAT	79504.52	8245.09	32140.71	8577.14	128467.46	72013.47	56453.99	5722.08	22.38	1376.52	7121.01	1416.15	49293.35	12.61
15	KAMRUP	65918.63	8884.97	22462.15	1975.13	99240.88	22542.87	76698.01	20233.92	239.58	3495.44	23968.96	3696.96	52527.55	31.25
16	KAMRUP (M) RURAL	9439.87	7515.06	4887.87	1755.74	23598.54	5367.78	18230.76	1533.84	71.9	431.98	2037.7	435.6	16189.44	11.18
17	KAMRUP (M) URBAN	3408.73	107.61	2135.66	24.84	5676.84	1530.19	4146.65	0	44.93	3177.75	3222.67	3203.51	898.22	77.72
18	KARBI ANGLONG	104922.72	491.96	26988.64	107.63	132510.95	26169.05	106341.9	1058.4	8.17	1919.21	2985.77	2032.03	103243.3	2.81
19	KARIMGANJ	41004.02	1096.05	19365.36	281.84	61747.27	29124.65	32622.62	85.68	2.64	1303.33	1391.66	1404.17	31130.13	4.27
20	KOKRAJHAR	136436.66	2598.85	42129.04	2011.55	183176.1	24331.77	158844.33	6328.56	0	1721.8	8050.38	1750.75	150764.99	5.07
21	LAKHIMPUR	88228.14	788.66	30085.16	204.89	119306.85	47368.26	71938.59	4480.56	10.49	2399.61	6890.69	2537.18	64910.33	9.58
22	MORIGAON	40352.84	2583.37	8474.76	2320.96	53731.93	10792.97	42938.96	10822.56	5.02	2278.91	13106.49	2470.27	29641.1	30.52
23	NAGAON	100753.37	8525.85	21452.74	10412.52	141144.48	39530.94	101613.54	27137.04	94.58	1774.25	29005.86	1912.31	72469.6	28.55
24	NALBARI	25734.6	155.72	8849.97	43.15	34783.44	3478.35	31305.09	7479.36	12.81	394.15	7886.34	409	23403.89	25.19
25	SIBSAGAR	74978.26	603.47	32055.39	187.06	107824.18	16704.31	91119.87	2721.6	72.06	1744.65	4538.3	1795.6	86530.64	4.98
26	SONITPUR	121757.09	1947.22	42220.16	1087.58	167012.05	40545.64	126466.41	8942.64	100.64	3959.28	13002.54	4160.16	113263	10.28
27	TINSUKIA	107817.56	2578.92	40135.93	1772.98	152305.39	27419.66	124885.73	4331.04	41.04	2043.34	6415.41	2146.38	118367.28	5.14
28	UDALGURI	48850.36	2535.4	22147.2	665.18	74198.14	23238.07	50960.07	4569.6	62.68	1515.63	6147.88	1560.71	44767.13	12.06
	Total(Ham)	**1929002.43**	**80659.82**	**653019.73**	**62580.79**	**2725262.77**	**632109.85**	**2093152.92**	**206043.6**	**1167.82**	**55359.44**	**262570.94**	**58461.77**	**1827479.65**	**12.54**
	Total(Bcm)	**19.29**	**0.81**	**6.53**	**0.63**	**27.25**	**6.3210985**	**20.93**	**2.06**	**0.01**	**0.55**	**2.63**	**0.58**	**18.27**	**12.54**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
BIHAR															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Araria	71874.22	43086.41	7485.44	28501.4	150947.47	13767.72	137179.75	26373.62	114	9289.55	35777.16	9930.12	100762.02	26.08
2	Arwal	10951.37	6450.24	0	3277.68	20679.29	1673.62	19005.67	5561.32	129	2532.87	8223.18	2707.53	10607.82	43.27
3	Aurangabad	52370.97	54078.6	1116.5	28766.31	136332.38	13511.18	122821.2	19647.43	2630.1	8583.46	30861.03	9175.33	91452.59	25.13
4	Banka	41945.92	15362.93	915.09	7030.29	65254.23	6008.2	59246.03	11331.27	94.12	6607.92	18033.31	7063.57	40757.08	30.44
5	Begusarai	44232.03	2869.53	2724.84	5043.06	54869.46	5486.91	49382.55	22021.73	73.2	9122.88	31217.81	9751.95	17535.66	63.22
6	Bhagalpur	58705.56	7440.78	6287.29	4599.15	77032.78	7703.3	69329.49	17599.23	1104.84	6664.16	25368.22	7123.72	43501.71	36.59
7	Bhojpur	46112.84	24563.91	1103.52	17402.46	89182.73	8905.56	80277.16	28673.57	715.45	8532.48	37921.51	9120.84	42211.99	47.24
8	Buxar	32650.03	18778.67	626.77	12913.39	64968.86	6317.64	58651.22	19272.33	486.95	5152.92	24912.2	5508.25	33383.7	42.48
9	Darbhanga	55514.21	8449.48	4990.37	6486.88	75440.94	7336.83	68104.12	22006.67	793.6	12847.21	35647.5	13733.09	31570.74	52.34
10	East Champaran	95333.37	57911.27	5352.08	33725.09	192321.81	18988.8	173333	51125.81	7176.69	16656.38	74958.88	18240.72	98256.75	43.25
11	Gaya	89395.82	21304.31	2497.4	11161.01	124358.54	11949.97	112408.56	39563.56	364.68	14115.09	54043.27	15088.38	57392.01	48.08
12	Gopalganj	46590.93	33086.33	1553.12	20246.47	101476.85	9664.27	91812.58	36196.74	511.21	8485.39	45193.39	9070.51	47888.13	49.22
13	Jamui	32684.06	7892.25	1686.34	4324.27	46586.92	3797.86	42789.06	8057.04	8.45	5906.21	13971.72	6313.45	29788.17	32.65
14	Jehanabad	17128.59	8065.28	462.46	6116.29	31772.62	3177.25	28595.37	20029.64	0	3478.81	23508.45	3718.69	6457.75	82.21
15	Kaimur	47242.02	19309.87	900.77	12566.08	80018.74	7917.35	72101.38	21918.9	32.67	5301.1	27252.65	5666.63	44688.37	37.8
16	Katihar	81870.63	21874.76	7209.24	15424.77	126379.4	11969.66	114409.74	51373.99	120.78	9393.91	60888.69	10041.67	52935.07	53.22
17	Khagaria	39977.95	2112.96	1883.05	4667.24	48641.2	4864.13	43777.08	20747.5	17.79	5290.43	26055.72	5655.24	17356.56	59.52
18	Kishanganj	62021.55	3212.26	5300.16	3613.52	74147.49	5515.29	68632.2	19352.99	298.5	5317.98	24969.48	5684.67	43296.03	36.38
19	Lakhisarai	21987.35	11622.51	1279.31	6733.6	41622.77	3937.22	37685.55	10576.92	4.2	3222.16	13803.27	3444.33	23778.51	36.63
20	Madhepura	43021.78	34951.07	3931.72	23909.39	105813.96	10581.42	95232.53	32371.51	124.2	6542.17	39037.84	6993.29	62385.47	40.99
21	Madhubani	77386.52	30607.22	8011.77	21141.55	137147.06	13462.99	123684.06	28520.58	9132.6	14582.38	52235.54	15587.92	71148.06	42.23
22	Munger	26217.8	8286.18	1545.83	2688.62	38738.43	3873.85	34864.58	6004.08	735.18	4382.62	11121.89	4684.81	23554.22	31.9
23	Muzaffarpur	72298.61	23652.52	4231.9	18197.33	118380.36	11483.72	106896.64	55501.95	1279.35	15242.84	72024.15	16293.9	34932.7	67.38
24	Nalanda	44440.24	8576.31	1283.24	7593.4	61893.19	6007.14	55886.05	31400.15	1852.01	9023.03	42275.19	9645.24	14909.04	75.65
25	Nawada	45557.71	12126.63	2056.28	8376.18	68116.8	6381.72	61735.07	24664.5	65.4	5733.56	30463.47	6128.91	30941.87	49.35
26	Patna	75889.63	16387.72	1990.62	13742.71	108010.68	10181.64	97875.01	41773.94	420.12	15885.77	58079.83	16981.15	39454.67	59.34
27	Purnea	87864.55	45993.42	8812.19	30159.96	172830.12	15901.54	156928.58	40342.46	1031.3	10046.13	51419.9	10738.84	107124.72	32.77
28	Rohtas	69538.3	33336.82	1554.07	21417.44	125846.63	12584.72	113261.9	36123.43	194.4	9263.5	45581.33	9902.25	68245.94	40.24
29	Saharsa	51434.24	13086.12	4221.66	8888.83	77630.85	7696.19	69934.66	18586.21	63	5780.78	24430.02	6179.39	45106.03	34.93
30	Samastipur	68077.24	9887.42	3001.88	7623.21	88589.75	8858.96	79730.79	41098.05	264.3	13532.46	54894.82	14465.58	24186.11	68.85
31	Saran	53852.68	31321.02	2193.7	19080.64	106448.04	9571.87	96876.16	38139.93	170.35	12507.08	50817.35	13369.51	47887.94	52.46
32	Sheikhpura	12807.78	2381.9	610.19	1865.76	17665.63	1603.86	16061.77	6732.45	2.4	2023.49	8758.33	2163.02	7206.88	54.53
33	Sheohar	12102.72	3858.91	844.06	1459.57	18265.26	1826.53	16438.72	7958.25	7	2142.75	10108	2290.5	6182.96	61.49
34	Sitamarhi	57089.04	4486.75	4163.59	3715.83	69455.21	6403.32	63051.89	20928.82	88	10852.21	31869.05	11600.5	30434.55	50.54
35	Siwan	50160.15	31263.81	887.5	22238.82	104550.28	10017.95	94532.32	40819.44	19.2	10452.01	51290.64	11172.74	42520.97	54.26
36	Supaul	52276.62	30623.15	4815.78	25292.11	113007.66	10971.7	102035.95	26411.81	71.3	7052.25	33535.38	7538.55	68014.28	32.87
37	Vaishali	49515.84	17370.34	1783.69	10470.35	79140.22	7914.02	71226.21	36169.24	2263.29	11038.9	49471.41	11800.07	23657.69	69.46
38	West Champaran	101589.63	45987.43	4241.96	30797.38	182616.4	16529.53	166086.88	27704.9	4396	12928.52	45029.4	13820	120187.89	27.11
	Total(Ham)	**1999710.5**	**771657.09**	**113555.38**	**511258.04**	**3396181.01**	**324345.43**	**3071881.48**	**1012681.94**	**36855.62**	**325513.33**	**1375051**	**348394.86**	**1701702.65**	**44.76**
	Total(Bcm)	**20**	**7.72**	**1.14**	**5.11**	**33.96**	**3.24**	**30.72**	**10.13**	**0.37**	**3.26**	**13.75**	**3.48**	**17.02**	**44.76**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023

CHHATISGARH

S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	**Balod**	15852.66	10272.46	0	12660.34	38785.46	3487.54	35297.92	23093.45	61.98	2227.76	25383.18	2356.22	10192.6	71.91
2	**Baloda Bazar**	25093.26	23926.27	412.24	8557.11	57988.88	5539.34	52449.54	19906.01	1183.96	4378.8	25468.78	5644.19	26941.21	48.56
3	**Balrampur**	44878.89	1568.02	309.07	2365.2	49121.18	4267.72	44853.46	7861.56	7.11	2039.4	9908.07	2200.65	34784.14	22.09
4	**Bastar**	21496.22	989.79	1752.02	2048.01	26286.04	2297.36	23988.68	5001.44	69.46	2266.3	7337.23	2400.33	16517.42	30.59
5	**Bemetara**	17197	13002.28	0	19666.13	49865.41	4700.03	45165.38	39585.47	102.07	2396.31	42083.83	2889.52	6818.17	93.18
6	**Bijapur**	49859.36	478.68	214.88	1386.26	51939.18	5193.92	46745.26	3059.84	1.72	671.9	3733.45	711.88	42971.82	7.99
7	**Bilaspur**	19944	15173.85	414.06	11993.49	47525.4	4282.42	43242.98	21349.51	591.25	5552.89	27493.64	6529.12	17345.66	63.58
8	**Dantewada**	25283.02	322.14	342.85	1346.37	27294.38	2729.44	24564.94	2801.46	187	768.55	3757.02	820	20756.47	15.29
9	**Dhamtari**	19403.57	18081.41	0	33500.99	70985.97	6663.24	64322.73	48161.52	62.3	2091.84	50315.64	2180.05	19973.45	78.22
10	**Durg**	14658.31	18579.99	0	11752.7	44991	4239.29	40751.71	25723.92	421.73	4901.88	31047.54	5135.19	10704.22	76.19
11	**Gariaband**	21086.5	7004.54	0	9165.85	37256.89	3563.66	33693.23	19833.14	11.5	1697.95	21542.56	1877.55	12001.7	63.94
12	**Gourela-Pendra-Marwahi**	11478.09	1288.68	545.15	1285.14	14597.06	1277.59	13319.47	3720.68	1.68	1117.18	4839.55	1324.53	8272.57	36.33
13	**Janjgir-Champa**	11902.08	14090.13	153.04	11754.58	37899.83	3465.99	34433.84	7390.16	238.93	2810.49	10439.53	3060.17	23744.63	30.32
14	**Jashpur**	26678.31	1960.69	873.6	3631.52	33144.12	2772.64	30371.48	10846.65	20.62	2217.09	13084.37	2320.47	17183.73	43.08
15	**Kabirdham**	30184.35	5832.57	5611.29	9656.61	51284.82	4638.41	46646.41	27935.68	61.96	2519.06	30516.72	2837.22	15949.35	65.42
16	**Kanker**	57507.98	2081.89	2224.16	7710.24	69524.27	5731.21	63793.07	19413.75	31.62	2027.16	21472.56	2150.07	42197.6	33.66
17	**Khairagarh-Chhuikhadan_Gandai**	8226.19	6287.45	98.12	6963.88	21575.64	1554.2	20021.44	14578.5	11.42	1065.43	15655.38	1161.58	4269.91	78.19
18	**Kondagaon**	28476	1516.66	2064.15	2289.1	34345.91	1831.05	32514.87	10398.22	20.64	1564.48	11983.32	1658.78	20689.5	36.85
19	**Korba**	38409.53	3955.18	676.81	5639.65	48681.17	2837.67	45843.51	9308.64	2768.33	3581.35	15658.32	3879.21	29901.1	34.16
20	**Korea**	9055.87	3134.99	3312.22	1962.97	17466.05	1137.44	16328.61	5567.81	151.89	655.66	6375.36	683.63	9925.28	39.04
21	**Mahasamund**	42455.75	13423.89	325.68	14234.88	70440.2	4952.53	65487.67	36296.5	87.77	2870.5	39254.77	3077.95	26025.46	59.94
22	**Manendragarh-Chirmiri_Bharatpur**	48108.19	1322.47	244.3	1852.8	51527.76	4396.77	47130.99	5998.95	424.78	1090.03	7513.76	1136.16	39571.09	15.94
23	**Mohla-Manpur_Ambagarhchowki**	12357.67	1853.22	144.29	2815.98	17171.16	1717.11	15454.05	4801.86	37.62	733.73	5573.22	767.82	9846.77	36.06
24	**Mungeli**	8526.88	5361.69	0	4989.62	18878.19	1790.31	17087.88	7652.85	28.09	1868.09	9549.04	2236.98	7169.95	55.88
25	**Narayanpur**	24792.42	327.67	772.79	509.63	26402.51	2640.25	23762.26	630.2	12.74	386.68	1029.61	412.02	22707.31	4.33
26	**Raigarh**	37523.45	2430.6	405.7	3434.35	43794.1	3877.86	39916.24	10086.68	3156.54	3096.59	16339.79	3302.28	23370.75	40.94
27	**Raipur**	18941.34	18835.68	42.18	11959.21	49778.41	4692.58	45085.83	20004.13	1727.45	6025.47	27757.07	6815.31	16702.68	61.56
28	**Rajnandgaon**	19352.23	7819.38	236.55	11227.79	38635.95	3464.29	35171.66	21191.23	193.47	3129	24513.71	4080.63	9706.32	69.7
29	**Sakti**	9029.17	10505.03	101.69	14071.24	33707.13	3232.67	30474.46	11768.55	5.25	1901.82	13675.64	2086.47	16614.16	44.88
30	**Sarangarh-Bilairagh**	14765.66	7011.1	361.15	3294.96	25432.87	1986.72	23446.14	6647.62	25.1	1809.97	8482.67	2028	14745.44	36.18
31	**Sukma**	43875.39	635.22	0	924.25	45434.86	4128.2	41306.66	1082.87	0.84	616.55	1700.25	636.6	39586.36	4.12
32	**Surajpur**	27888.37	2799.73	217.28	9882.33	40787.71	3230.81	37556.9	21995.88	781.11	2154.37	24931.37	2298.05	12481.83	66.38
33	**Surguja**	34351.56	1923.21	885.79	4610.16	41770.72	3627.62	38143.1	12958.14	986.09	2296.91	16241.16	2436.01	21762.84	42.58
	Total(Ham)	**838639.27**	**223796.56**	**22741.06**	**249143.34**	**1334320.23**	**115947.88**	**1218372.37**	**486652.87**	**13474.02**	**74531.19**	**574658.11**	**83134.64**	**651431.49**	**47.17**
	Total (Bcm)	**8.39**	**2.24**	**0.23**	**2.49**	**13.34**	**1.16**	**12.18**	**4.87**	**0.13**	**0.75**	**5.75**	**0.83**	**6.51**	**47.17**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
DELHI															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Central	248	704.6	105.61	1393.29	2451.5	245.15	2206.35	244.79	0	1496.18	1740.96	2087.35	487.11	78.91
2	East	84.21	508.93	41.13	1001.76	1636.03	163.62	1472.41	110.55	0.2	1282.15	1392.91	1439.42	79.5	94.6
3	Nazul Land	224.11	65.89	109.46	110.43	509.89	50.99	458.9	228	0	86.04	314.04	86.04	144.86	68.43
4	New Delhi	660.52	653.9	353.23	1245.39	2913.04	291.3	2621.74	686.87	2.2	2923.44	3612.52	2923.45	0	137.79
5	North	1629.66	819.07	636.08	1590.9	4675.71	467.57	4208.14	489.77	50.31	4052.92	4592.99	4084.62	208.08	109.15
6	North East	98.6	546.49	46.38	1083.76	1775.23	177.52	1597.71	176.76	0	1513.62	1690.38	1513.62	107.5	105.8
7	North West	794.88	858.02	358.56	1702.12	3713.58	259.42	3454.16	499	0.56	1778.74	2278.3	2378.75	1175.86	65.96
8	Shahdara	78.31	505.77	36.03	988	1608.11	160.81	1447.3	338.61	0.5	1330	1669.1	1375.51	4.27	115.33
9	South	732.45	1132.75	402.33	2206.93	4474.46	447.44	4027.02	733.13	0	3807.97	4541.1	3807.97	1.75	112.77
10	South East	401.17	676.31	220.36	1328.14	2625.98	262.6	2363.38	220.17	12.74	2075.35	2308.26	2075.35	55.12	97.67
11	South West	2270.74	1573.09	988.66	2883.6	7716.09	771.61	6944.48	4002.81	0	2496.6	6499.41	3020.21	360.84	93.59
12	West	1067.65	870.1	416.57	1698.61	4052.93	405.29	3647.64	731.98	0.6	2778	3510.58	2778	245.11	96.24
	Total(Ham)	**8290.3**	**8914.92**	**3714.4**	**17232.93**	**38152.55**	**3703.32**	**34449.23**	**8462.44**	**67.11**	**25621.01**	**34150.55**	**27570.29**	**2870**	**99.13**
	Total(Bcm)	**0.08**	**0.09**	**0.04**	**0.17**	**0.38**	**0.04**	**0.34**	**0.08**	**0.0007**	**0.26**	**0.34**	**0.28**	**0.03**	**99.13**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
GOA															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	**Goa North**	14723.07	329.14	53.52	1409.27	16515	3302.99	13212.01	1558.44	96.1	1674.38	3328.93	1755.09	9802.37	25.2
2	**South Goa**	20887.06	464.61	287.17	1470.58	23109.42	4621.87	18487.55	926.37	375.44	2144.48	3446.29	2247.86	14937.87	18.64
	Total(Ham)	**35610.13**	**793.75**	**340.69**	**2879.85**	**39624.42**	**7924.86**	**31699.56**	**2484.81**	**471.53**	**3818.86**	**6775.22**	**4002.95**	**24740.24**	**21.37**
	Total(Bcm)	**0.356**	**0.008**	**0.003**	**0.029**	**0.396**	**0.079**	**0.317**	**0.025**	**0.005**	**0.038**	**0.068**	**0.040**	**0.247**	**21.370**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
GUJARAT															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Ahmedabad	23822.27	8230.94	0	13896.99	45950.2	3521.59	42428.61	32678.1	3350.94	1020.99	37050.03	-1022.17	12073.57	87.32
2	Amreli	138927.37	6893.14	0	10529.44	156349.95	7817.53	148532.42	73577.7	54.77	1198.3	74830.77	1192.32	73669.8	50.38
3	Anand	31512.49	37179.88	0	47598.47	116290.84	8790.39	107500.45	20627	375.33	3548.55	24550.86	3161.87	82808.29	22.84
4	Arvalli	79638.71	3393.73	0	7191.68	90224.12	4511.2	85712.92	33871.9	25.39	2032.84	35930.13	2144.33	49671.3	41.92
5	Banaskantha	97992.88	14866.25	0	16376.18	129235.31	12509.5	116725.81	130515.1	143.9	4185.04	134844.05	3694.49	14499.03	115.52
6	Bharuch	40835.84	8682.27	0	19756.16	69274.27	6392.3	62881.97	16951.2	668.92	1816.17	19436.28	1255.96	43370.14	30.91
7	Bhavnagar	90842.4	7677.03	0	13459.42	111978.85	5598.94	106379.91	42332.1	31.05	3150.66	45513.82	2576.98	60694.55	42.78
8	Botad	40474.71	2346.01	0	3958.45	46779.17	2338.94	44440.22	21423.8	16.67	895.11	22335.57	827.25	22055.9	50.26
9	Chhota Udepur	40295.86	6586.33	0	12823.26	59705.45	4914.82	54790.63	19679.5	0.18	2211.15	21890.84	2312.02	32798.92	39.95
10	Dahod	16490.55	7050.35	0	10682.23	34223.13	3099.28	31123.85	10029.6	1.89	2260.84	12292.31	2524.79	18567.6	39.49
11	Dang	28529.01	892.19	0	1021.62	30442.82	3044.29	27398.53	2189.6	62.76	486.29	2738.65	522.81	24623.36	10
12	Devbhumi Dwarka	41008.34	2529.29	0	4249.6	47787.23	2389.36	45397.87	23978.5	107.72	1564.01	25650.24	1528.49	19680.86	56.5
13	Gandhinagar	44687.02	6658.26	0	11610.77	62956.05	5345.76	57610.28	50911.8	898.54	1365	53175.34	1807.11	7083.72	92.3
14	Gir Somnath	67039	2759.69	0	6209.24	76007.93	6039.17	69968.76	28708.6	400.56	2969.9	32079.05	3052.55	37777.69	45.85
15	Jamnagar	128719.54	7000.88	0	12389.09	148109.51	7405.49	140704.02	48804	43.08	2398.18	51245.27	2403.03	89356.38	36.42
16	Junagadh	148258.46	4780.88	0	9106.24	162145.58	8107.25	154038.31	61887.1	70.48	3131.48	65089.06	3274.25	88668.27	42.26
17	Kachchh	64718.36	16051.8	0	20115.7	100885.86	8875.03	92010.83	47619.5	1049.83	1058.16	49727.51	-1448.81	45494.58	54.05
18	Kheda	41353.66	13571.46	0	27631.96	82557.08	7696.03	74861.05	26939	401.08	2856.47	30196.52	2617.57	44548.74	40.34
19	Mahesana	48242.82	10424.06	0	19748.75	78415.63	7397.84	71017.8	74678.5	722.9	1436.6	76838.02	996.37	4786.05	108.2
20	Mahisagar	15894.3	5139.55	0	10741.71	31775.56	3177.55	28598.01	12580.9	17.23	893.43	13491.57	941.6	15058.27	47.18
21	Morbi	43746.95	9515.92	0	20352.29	73615.16	4744.55	68870.62	30045.3	126.43	1442.88	31614.6	1412.18	37160.9	45.9
22	Narmada	27832	4746.22	0	7959.67	40537.89	2700.29	37837.6	20534	37.09	539.12	21110.19	564.93	16701.61	55.79
23	Navsari	60214.28	5052.09	0	15814.22	81080.59	5388.16	75692.43	17732.2	140.24	2671.91	20544.35	2739.64	55080.36	27.14
24	Panchmahal	19574.95	14122.71	0	22709.22	56406.88	3755.11	52651.77	9869.8	96.42	1518.98	11485.2	1610.27	41075.29	21.81
25	Patan	24565.31	5757.97	0	9394.38	39717.66	3314.25	36403.41	34975.28	51.85	916.89	35944	476.86	4011.79	98.74
26	Porbandar	19759.9	1096.57	0	1953.06	22809.53	1523.73	21285.79	10037.5	108.8	518.58	10664.89	161.94	10606.15	50.1
27	Rajkot	143424.48	13946.61	0	23456	180827.09	9041.35	171785.74	105382.8	75.98	2515.47	107974.25	2687.82	63639.14	62.85
28	Sabarkantha	55291.99	9027.13	0	17968.11	82287.23	8228.72	74058.51	50497.16	283.06	2027.68	52807.92	2345.15	22467.11	71.31
29	Surat	95279.28	9940.3	0	38374.7	143594.28	11258.32	132335.96	29698.9	4539.06	18559.73	52797.68	21869.76	80658.02	39.9
30	Surendranagar	63492.91	7018.76	0	11819	82330.67	4783.4	77547.27	35473.2	255.28	1258.91	36987.39	-282.18	40494.33	47.7
31	Tapi	49059.82	4908.75	0	16606.63	70575.2	6912.88	63662.32	20404.4	29.99	499.5	20933.89	864.08	42363.84	32.88
32	Vadodara	60987.69	11681.11	0	31602.56	104271.36	6338.71	97932.65	54410.1	2095.01	6522.31	63027.42	6819.85	34607.67	64.36
33	Valsad	56040.73	5312.34	0	14570.68	75923.75	7592.36	68331.39	13538.9	307.81	4298.99	18145.69	4608.56	49876.14	26.56
	Total(Ham)	**1948553.88**	**274840.47**	**0**	**511677.48**	**2735071.83**	**194554.09**	**2540517.71**	**1212583.03**	**16590.26**	**83770.13**	**1312943.4**	**80241.67**	**1286029.37**	**51.68**
	Total(Bcm)	**19.49**	**2.75**	**0**	**5.12**	**27.35**	**1.95**	**25.41**	**12.13**	**0.17**	**0.84**	**13.13**	**0.8**	**12.86**	**51.68**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
HARYANA															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Ambala	24078.67	7930.23	5060.25	6816.8	43885.95	4388.6	39497.35	34025.58	7575	7003.16	48603.74	7003.16	2215.66	123.06
2	Bhiwani	18561.4	13002.37	1979.98	12460.14	46003.89	4078.61	41925.28	42053.54	1912	750	44715.54	780.08	8654.64	106.66
3	Charkhi Dadri	8998.4	5006.87	2507	4208.29	20720.56	2072.06	18648.5	22190.08	28	1253.5	23471.58	1265.99	4903.34	125.86
4	Faridabad	5732.81	3294.41	1003.9	3047.45	13078.57	1307.87	11770.7	14134.05	5076	4384.01	23594.05	4409.5	0	200.45
5	Fatehabad	13125.8	27661.28	1779.59	28905.98	71472.65	6772.48	64700.17	116059.67	131	1859.58	118050.26	1859.58	284.33	182.46
6	Gurgaon	9657.75	5120.79	3206.15	4345.38	22330.07	2145.93	20184.14	20951.93	17117.17	5124.38	43193.49	5124.38	0	214
7	Hisar	22226.03	15082.33	2222.87	20716.62	60247.85	4862.15	55385.7	48236.83	230.22	366.2	48833.25	366.2	14674	88.17
8	Jhajjar	13014.31	10853.33	1792.57	11200.73	36860.94	3467.56	33393.38	17595.93	115	367.38	18078.31	367.38	15315.07	54.14
9	Jind	19200.35	31434.07	7884.03	26434.44	84952.89	6438.12	78514.77	80311.67	612.26	1729.74	82653.67	2470.73	7705.77	105.27
10	Kaithal	15827.28	16510.73	2786.69	12108.78	47233.48	4471.87	42761.61	79545.65	633.75	2695.09	82874.49	3073.65	0	193.81
11	Karnal	27643.37	34373.93	4181.07	28604.73	94803.1	8804.79	85998.31	132525.44	7558.9	8629.27	148713.61	8629.27	524.28	172.93
12	Kurukshetra	16322.52	11944.77	2636.87	10326.51	41230.67	3906.58	37324.09	67254.48	12575.88	4635.75	84466.11	4635.75	0	226.3
13	Mahendragarh	8089.47	4220.93	2350.06	7611.54	22272	2227.21	20044.79	26081.16	31.08	3256	29368.24	3256	65.6	146.51
14	Mewat	6543.86	4169.94	2301.14	4756.18	17771.12	1777.13	15993.99	10747.57	19.91	2062.38	12829.87	2062.38	3950.3	80.22
15	Palwal	9303.04	12561.08	1088.83	15664.84	38617.79	3555.9	35061.89	30158.92	702.12	2222.25	33083.3	2222.25	6807.3	94.36
16	Panchkula	10220.74	1313.89	1650.97	1029.86	14215.46	911.26	13304.2	7149.5	90	1143.18	8382.68	1143.18	4921.52	63.01
17	Panipat	9387.87	11322.83	2072.12	10719.89	33502.71	3350.28	30152.43	55060.35	2440	2249.8	59750.16	2249.8	0	198.16
18	Rewari	9541.51	5555.22	3485.23	9828.24	28410.2	2000.86	26409.34	31590.68	1452	2032.56	35075.24	2032.56	359.53	132.81
19	Rohtak	11876.59	9879.57	2948.2	8883.7	33588.06	3358.82	30229.24	16044.35	166.06	471.18	16681.59	471.18	13547.65	55.18
20	Sirsa	19992.58	18591.56	1280.52	20698.07	60562.73	4546.83	56015.9	80452.79	266.07	2456.13	83174.99	2456.13	2245.61	148.48
21	Sonipat	17780.96	19504.85	3444.78	19526.62	60257.21	5712.56	54544.65	51059.46	939.29	2813.01	54811.76	2813.01	10433.17	100.49
22	Yamuna Nagar	20765.34	18099.41	5197.82	18792.06	62854.63	5661.93	57192.7	71959.7	2340	4928.26	79227.96	4928.26	3456.76	138.53
	Total(Ham)	**317890.65**	**287434.39**	**62860.64**	**286686.85**	**954872.53**	**85819.4**	**869053.13**	**1055189.33**	**62011.71**	**62432.81**	**1179633.9**	**63620.42**	**100064.53**	**135.74**
	Total(Bcm)	**3.18**	**2.87**	**0.63**	**2.87**	**9.55**	**0.86**	**8.69**	**10.55**	**0.62**	**0.62**	**11.8**	**0.64**	**1**	**135.74**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
HIMACHAL PRADESH															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Kangra	30927.94	8033.12	6602.99	9744.48	55308.53	5530.85	49777.68	5653.21	40.71	5888.95	11582.87	5888.95	38194.81	23.26920419
2	Mandi	3248.74	2156.3	1208.25	1773.33	8386.62	575.09	7811.53	262.92	0	849.91	1112.83	849.91	6698.69	14.24599278
3	Sirmaur	9256.12	102.81	594.89	121.78	10075.6	1007.56	9068.04	730.67	287.6	962.05	1980.33	962.05	7087.71	21.8385671
4	Solan	6062.93	4256.62	1567.81	4303.49	16190.85	809.54	15381.31	2651.37	4917.46	1213.01	8781.84	1213.01	6599.47	57.09422669
5	Una	12144.15	3186.59	2671.28	3527.17	21529.19	2114.62	19414.57	8793.22	168.33	3040.79	12002.35	3040.79	7412.22	61.82135376
	Total(Ham)	**61639.88**	**17735.44**	**12645.22**	**19470.25**	**111490.79**	**10037.66**	**101453.13**	**18091.39**	**5414.1**	**11954.7**	**35460.22**	**11954.71**	**65992.9**	**34.95**
	Total(Bcm)	**0.62**	**0.18**	**0.13**	**0.19**	**1.11**	**0.1**	**1.01**	**0.18**	**0.05**	**0.12**	**0.35**	**0.12**	**0.66**	**34.95**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
JHARKHAND															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Bokaro	18003.58	1458.23	1993.99	1064.96	22520.76	1756.14	20764.62	2393	2057.92	4384.12	8835.07	4406.13	12501.03	42.55
2	Chatra	22639.53	2121.11	755.28	1932.44	27448.36	2102.74	25345.62	6112	869.94	1930.77	8912.73	1940.46	16423.19	35.16
3	Deoghar	12269.82	1395.26	1331.1	1457.67	16453.85	1008.03	15445.82	5334	35.56	2873.25	8242.79	2887.67	7188.62	53.37
4	Dhanbad	18784.16	3793.65	1409.48	3761.71	27749	2320.72	25428.28	2962	10049.83	5891.17	18902.97	5920.74	6641.04	74.34
5	Dumka	19905.07	2852.28	3265.87	1619.3	27642.52	2337.49	25305.03	3749.75	23.62	2453.34	6226.7	2465.65	19066.01	24.61
6	East Singhbhum	21716.91	1469.56	2752.11	1350.14	27288.72	2251.1	25037.62	1860	758.04	4995.34	7613.4	5020.41	18355.49	30.41
7	Garhwa	24398.42	2399.02	1295.9	2343.56	30436.9	2688.28	27748.62	7531.88	60.53	2328.13	9920.52	2339.79	17816.44	35.75
8	Giridih	33982.02	3009.81	2204.78	2546.32	41742.93	3206.12	38536.81	9022.88	955.96	4567.28	14546.1	4590.2	23967.8	37.75
9	Godda	18646.07	1757.05	1626.54	1032.54	23062.2	1686.28	21375.92	1869	258.6	2422.25	4549.84	2434.43	16813.91	21.28
10	Gumla	29031.65	707.35	3499.41	998.65	34237.06	2823.11	31413.95	3789.5	12.54	1801.04	5603.05	1810.09	25801.85	17.84
11	Hazaribagh	28025.99	2124.46	2209.45	2478.76	34838.66	3199.8	31638.86	7851.38	470.25	3323.59	11645.2	3340.24	19977	36.81
12	Jamtara	6004.74	1368.34	829.68	947.7	9150.46	727.73	8422.73	2280.25	10.16	1482.96	3773.33	1490.39	4641.96	44.8
13	Khunti	11024.24	658.81	1075.88	738.68	13497.61	962.17	12535.44	2385	12.59	993.2	3390.8	998.18	9139.67	27.05
14	Koderma	4954.73	374.86	434.49	623.1	6387.18	502.76	5884.42	2468.88	50.31	1390.63	3909.82	1397.61	1967.62	66.44
15	Latehar	18701.36	2498.15	1493.79	1915.24	24608.54	2121.88	22486.66	5109	105.74	1351.16	6565.91	1357.96	15913.95	29.2
16	Lohardaga	17366.91	505.26	1382.32	590.3	19844.79	1855.75	17989.04	1833.5	8.17	874.4	2716.07	878.78	15268.58	15.1
17	Pakur	21595.67	1425.7	2685.38	908.5	26615.25	2661.53	23953.72	1911.5	28.46	1525.58	3465.53	1533.24	20480.54	14.47
18	Palamau	23919.33	6359.2	1463.36	2515.88	34257.77	2888.52	31369.25	7094.5	217.36	3663.16	10975	3681.55	20375.86	34.99
19	Ramgarh	7781.61	1198.61	779.56	1265.21	11024.99	734.36	10290.63	1457	2958.23	1996.01	6411.24	2006.04	3909.66	62.3
20	Ranchi	31011.28	2660.83	3313.74	3354.56	40340.41	3300.93	37039.48	9584.63	1694.99	6107.66	17387.25	6138.3	19621.57	46.94
21	Sahebganj	24353.85	2920.8	2059.93	1390.49	30725.07	2931.48	27793.59	2207	50.29	2189.56	4446.84	2200.55	23335.75	16
22	Saraikela Kharsawan	14818.71	791.54	1677.91	525.2	17813.36	1542.76	16270.6	1099.5	527.18	2099.9	3726.6	2110.44	12533.45	22.9
23	Simdega	24077.31	569.18	737.13	626.96	26010.58	2059.51	23951.07	2034	0	1114.49	3148.47	1120.1	20796.99	13.15
24	West Singhbhum	43203.17	1471.81	5800.96	979.78	51455.72	4389.31	47066.41	2025.5	29.84	2865.28	4920.63	2879.66	42131.4	10.45
	Total(Ham)	**496216.13**	**45890.87**	**46078.04**	**36967.65**	**625152.69**	**52058.5**	**573094.19**	**93965.63**	**21246.09**	**64624.25**	**179835.86**	**64948.61**	**394669.38**	**31.38**
	Total(Bcm)	**4.96**	**0.46**	**0.46**	**0.37**	**6.25**	**0.52**	**5.73**	**0.94**	**0.21**	**0.65**	**1.8**	**0.65**	**3.95**	**31.38**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
KARNATAKA															
		Ground Water Recharge							Current Annual Ground Water Extraction						
		Monsoon Season		Non-monsoon Season											
S. No.	Name of District	Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Irrigation	Industrial	Domestic	Total	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	**Bagalkot**	21631.68	22330.06	1748.07	26367.4	72077.21	7207.74	64869.47	48589.44	28.29	4395.74	53013.48	4601.51	27266.76	81.72
2	**Ballari**	13976.06	40070.53	2093.77	12640.77	68781.13	6878.11	61903.02	14686.1	373.6	1935.81	16995.49	2108.96	45087	27.46
3	**Belagavi**	52574.7	24110.65	15457.87	33788.16	125931.38	11790.46	114140.93	64694.57	224.81	12363.56	77282.97	13928.72	40935.77	67.71
4	**Bengaluru (Rural)**	6192.02	2668.55	6607.73	5207.91	20676.21	1865.35	18810.86	25567.5	820.28	2581.28	28969.06	2771.15	0	154
5	**Bengaluru (Urban)**	12896.1	4308.32	407.19	6106.24	23717.85	2371.78	21346.07	20636.4	8025.9	3536.03	32198.34	3659.66	0	150.84
6	**Bidar**	31175.27	3568.32	50.07	2832.98	37626.64	3743.89	33882.75	15600.4	0	4264.98	19865.37	4416.03	13908.04	58.63
7	**Chamarajanagara**	20840.72	8409.78	5386.72	5282.48	39919.7	3678.34	36241.36	32264.69	27.02	2693.01	34984.71	3173.32	3876.96	96.53
8	**Chikkaballapura**	19438.1	4971.91	2571.38	7856.75	34838.14	3483.82	31354.32	45125.54	95.52	3008.42	48229.52	3173.68	0	153.82
9	**Chikkamagaluru**	32413.5	21149.89	2598.49	13667.56	69829.44	6982.95	62846.49	30960.21	0.15	2476.01	33436.36	2625.54	31378.58	53.2
10	**Chitradurga**	24985.26	9679.42	5314.75	6497.39	46476.82	4647.69	41829.13	51343.5	95.61	3878.19	55317.28	4073.87	937.46	132.25
11	**Dakshina Kannada**	53194.4	4172.62	9162.05	6800.43	73329.5	7332.96	65996.54	24371.36	40.16	5139.8	29551.31	5501.6	36083.43	44.78
12	**Davanagere**	15438.88	32654.75	3087.02	11427.46	62608.11	6260.82	56347.28	46245.8	228.05	3621.8	50095.67	3732.26	18487.56	88.91
13	**Dharwad**	14918.27	6807.63	3638.49	6951.27	32315.66	3231.57	29084.09	14569.69	76.16	1710.36	16356.21	1769.03	12669.21	56.24
14	**Gadag**	11516.25	10500.7	4716.6	8654.66	35388.21	3101.59	32286.62	23405.27	27.68	660.82	24093.78	732.18	8766.67	74.62
15	**Hassan**	30019.39	25652.84	2036.48	21589.1	79297.81	7929.79	71368.02	47882.71	0	3038.26	50920.97	3142.7	28276.84	71.35
16	**Haveri**	15113.86	33945.76	6570.64	10173.55	65803.81	6580.38	59223.42	34099.16	73.02	1947.17	36119.33	2184.68	25278.79	60.99
17	**Kalburgi**	56575.11	6220.58	835.2	8358.98	71989.87	6703.77	65286.1	19615.07	47.7	7142.53	26805.32	7653.22	38440.23	41.06
18	**Kodagu**	18743.31	3591.82	344.27	1998.45	24677.85	2467.79	22210.06	7953.69	94.88	922.58	8971.17	956.23	13205.23	40.39
19	**Kolara**	17117.14	7895.21	4241.97	16228.09	45482.41	4548.24	40934.17	66486.47	150.38	4097.33	70734.18	4297.6	0	172.8
20	**Koppal**	17042.03	30438.45	2300.28	15395.99	65176.75	6073.01	59103.74	33746.09	50.76	2753.44	36550.27	2926.84	26269.14	61.84
21	**Mandya**	19423.26	25157.3	2555.88	26261.12	73397.56	7202.19	66195.36	36219.99	66.85	3928.95	40215.79	4003.43	28841.47	60.75
22	**Mysuru**	28687.82	17886.44	3173.1	12631.79	62379.15	5996.61	56382.54	26852.6	85.98	4238.66	31177.25	4514.11	25386.68	55.3
23	**Raichur**	32447.04	33612.12	2772.65	8476.79	77308.6	7491.55	69817.05	27814.45	172.84	3240.05	31227.31	3589.07	40007.84	44.73
24	**Ramanagara**	9337.69	15539.06	7616.81	12767.3	45260.86	4526.08	40734.78	35196.42	722.88	3092.61	39011.9	3295.89	4224.52	95.77
25	**Shivamogga**	61937.02	27058.57	1291.5	16208.9	106495.99	9921.4	96574.59	36300.2	253.83	2678.67	39232.7	2749.97	59085.89	40.62
26	**Tumakuru**	43088.23	15074.71	9448.31	15406.17	83017.42	8301.74	74715.68	62774.52	71.03	5722.89	68568.46	5984.2	14452	91.77
27	**Udupi**	44705.43	2977.04	627.89	4065.13	52375.49	5237.57	47137.92	13778.54	35.92	2095.9	15910.35	2144.62	31178.85	33.75
28	**Uttara Kannada**	80697.72	3676.62	1196.29	7341.55	92912.18	9010.57	83901.61	23813.65	0	3126.83	26940.47	3194.97	56892.99	32.11
29	**Vijayanagara**	21482.69	8350.51	3441.07	7641.73	40916	3949.13	36966.86	28622.8	30.96	2209.38	30863.1	2326.63	8017.79	83.49
30	**Vijayapura**	71998.06	21398.03	561.19	12039.89	105997.17	10599.72	95397.45	33608.46	18.25	5012.5	38639.19	5237.46	57666.79	40.5
31	**Yadgir**	22412.41	20715.91	299.37	13160.11	56587.8	5396.68	51191.12	15705.35	882.11	2857.96	19445.4	3037.63	32559.1	37.99
	Total(Ham)	**922019.42**	**494594.1**	**112153.1**	**363826.1**	**1892592.72**	**184513.29**	**1708079.4**	**1008530.65**	**12820.62**	**110371.51**	**1131722.7**	**117506.76**	**729181.59**	**66.26**
	Total(Bcm)	**9.22**	**4.95**	**1.12**	**3.64**	**18.93**	**1.85**	**17.08**	**10.09**	**0.13**	**1.1**	**11.32**	**1.18**	**7.29**	66.26

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
KERALA															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	**Alappuzha**	28116.78	424.94	3337.35	6780.45	38659.52	2615.69	36043.83	3737.24	261.52	10178.12	14176.88	10454.89	21590.18	39.33
2	**Ernakulam**	36360.83	1264.41	6718.97	6919.52	51263.73	5016.04	46247.69	7946.47	213.8	14790.76	22951.01	19055.84	19031.6	49.63
3	**Idukki**	18146.98	312.21	635.78	1856.99	20951.96	2095.18	18856.78	6066.22	13.26	4141.9	10221.39	4141.91	8635.39	54.21
4	**Kannur**	38195.92	857.49	1464.22	3763.64	44281.27	4428.13	39853.14	8153.02	43.37	11628.57	19824.95	14322.08	17484.7	49.75
5	**Kasargod**	28213.22	1169.33	1406.13	4120.29	34908.97	3490.9	31418.07	15371.64	22.76	7462.24	22856.64	11401.69	5529.4	72.75
6	**Kollam**	25616.89	836.88	6656.48	2708.07	35818.32	3483.55	32334.77	4843.89	22.28	11926.81	16793	12609.6	14858.98	51.93
7	**Kottayam**	29841.67	768.6	4635.87	5566.75	40812.89	3781.4	37031.49	4928.47	10.18	8805.41	13744.06	9194.25	22898.59	37.11
8	**Kozhikkode**	31007.37	454.75	1151.1	1417.87	34031.09	3403.12	30627.97	4328.71	7.09	14561.73	18897.53	20923.94	6781.84	61.7
9	**Malappuram**	40613.41	1011.82	4314.07	7722.78	53662.08	5228.02	48434.06	9214.83	5.85	25432.31	34652.96	55023.8	13781.1	71.55
10	**Palakkad**	30114.89	4226.85	3044.03	24801.02	62186.79	5418.61	56768.18	17855.8	612.77	15452.41	33921.03	22322.49	18220.22	59.75
11	**Pathanamthitta**	17008.01	490.12	3655.13	1916.88	23070.14	2199.76	20870.38	3776.15	3.85	4072.62	7852.62	4195.98	12894.39	37.63
12	**Thiruvananthapuram**	19144.03	586.09	6149.96	2660.63	28540.71	2759.07	25781.64	4892.46	7.09	12562.22	17461.79	13568.35	7313.72	67.73
13	**Thrissur**	45158.5	1063.61	1261.06	14414.41	61897.58	6017.07	55880.51	19901.98	39.11	14114.02	34055.11	17127.38	18812.01	60.94
14	**Wayanad**	21523.9	441.35	0	677.48	22642.73	2264.27	20378.46	1324.38	158.66	4154.74	5637.78	5047.47	13847.95	27.67
	Total(Ham)	**409062.4**	**13908.45**	**44430.15**	**85326.78**	**552727.78**	**52200.81**	**500526.97**	**112341.24**	**1421.59**	**159283.85**	**273046.75**	**219389.67**	**201680.07**	**54.55**
	Total(Bcm)	**4.09**	**0.14**	**0.44**	**0.85**	**5.53**	**0.52**	**5.01**	**1.12**	**0.01**	**1.59**	**2.73**	**2.19**	**2.02**	**54.55**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
MADHYA PRADESH															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Agar Malwa	31757.01	2604.03	0	9187.76	43548.8	3145.59	40403.21	34666.65	3.67	1666.65	36336.96	1766.32	6513.75	89.94
2	Alirajpur	18876.87	770.93	0	1842.27	21490.07	1559.87	19930.2	6722.33	0	1910.82	8633.15	2049.42	11158.44	43.32
3	Anuppur	26118.32	200.17	2107.1	400.77	28826.36	1832.62	26993.74	1483.55	3303.32	1562.47	6349.33	1623.03	20583.85	23.52
4	Ashoknagar	29228.49	2196.8	0	8067.76	39493.05	2668.71	36824.34	21381.39	1.41	1824.21	23207.03	1927.85	13513.68	63.02
5	Balaghat	69810.74	3960.44	224.2	3158.61	77153.99	5204.94	71949.04	12657.22	400.93	3851.18	16909.36	4018.37	54872.5	23.5
6	Barwani	32743.41	3706.25	0	19392.12	55841.78	3805.6	52036.18	33377.29	37.99	3727.85	37143.14	4139.91	19039.54	71.38
7	Betul	85090.59	3707.86	2418.12	13682.15	104898.72	7148.41	97750.31	44632.8	168.93	3726.52	48528.3	3917.52	49031.02	49.65
8	Bhind	82570.26	1679.99	0	13789.97	98040.22	8086.63	89953.59	25562.24	248.88	3562.49	29373.62	3758.17	60384.28	32.65
9	Bhopal	31677.21	2441.93	0	6631.29	40750.43	2801.68	37948.75	23916.38	686.41	5110.13	29712.91	5584.57	7761.4	78.3
10	Burhanpur	27844.06	1986.04	264.63	6586.68	36681.41	2718.56	33962.85	21940.49	35.42	1728.73	23704.63	1859.14	10127.82	69.8
11	Chhatarpur	64676.93	5042.92	0	17041.54	86761.39	5861.63	80899.76	49738.65	79.68	3105.27	52923.58	3324.12	27798.46	65.42
12	Chhindwara	86713.02	4167.05	604.31	13324.36	104808.74	7203.55	97605.19	55742.33	580.56	5400.1	61722.98	5674.98	35665.53	63.24
13	Damoh	27977.31	2179.31	0	9222.16	39378.78	2802.61	36576.17	18757.67	299.37	2331.94	21388.93	2735.18	14784	58.48
14	Datia	34922.82	908.75	0	7244.29	43075.86	2953.54	40122.32	12664.84	33.36	1766.56	14464.77	1894.54	25529.57	36.05
15	Dewas	66076.9	5016.1	0	15456.72	86549.72	5605.14	80944.58	60357.41	95.48	4300.72	64753.63	4579.59	18015.08	80
16	Dhar	86346.09	6948.91	0	45165.44	138460.44	10693.76	127766.67	76853.59	635.01	6069.37	83557.97	6648.4	55147.1	65.4
17	Dindori	33813.45	277.72	288.23	628.8	35008.2	1750.4	33257.8	2316.18	0	1848.41	4164.57	1986.42	28955.23	12.52
18	Guna	62490.49	4340.17	0	14851.05	81681.71	4367.12	77314.59	47608.79	78.24	2532.84	50219.89	2715.98	26911.56	64.96
19	Gwalior	56193.02	7877.46	0	18174.39	82244.87	6471.15	75773.72	18052.15	270.78	5484.37	23807.29	6003.22	51447.58	31.42
20	Harda	28181.73	2916.12	0	15859.07	46956.92	3009.31	43947.6	14405.04	16.17	1243.99	15665.19	1330.85	28195.56	35.65
21	Hoshangabad	130455.74	7570.29	0	41247.63	179273.66	15577.28	163696.36	40065.19	18.64	2251.42	42335.23	2355.8	121256.77	25.86
22	Indore	41623.6	4517.11	0	12608.31	58749.02	5312.66	53436.36	54421.57	1500.83	7870.51	63792.93	8966.3	2547.06	119.38
23	Jabalpur	54728.53	3205.37	0	8795.3	66729.2	5432.37	61296.83	25295.9	318.94	5834.34	31449.17	6466.18	29704.16	51.31
24	Jhabua	20152.36	1230.75	0	4700.23	26083.34	1802.86	24280.48	8065.63	0.44	2810.21	10876.28	3147.85	13066.56	44.79
25	Katni	34347.6	1827.32	0	4750.49	40925.41	2896.22	38029.19	14014.73	1116.18	2786.79	17917.68	2996.11	19902.19	47.12
26	Khandwa	56949.53	4252.59	0	52690.25	113892.37	8696.11	105196.25	40541.57	69.64	3025.19	43636.4	3243.92	61341.13	41.48
27	Khargone	54255.99	6263.73	0	36982.82	97502.54	5354.7	92147.84	37725.95	78.26	4518.09	42322.26	4866.61	49477.05	45.93
28	Mandla	43130.31	1059.93	865.06	4178.82	49234.12	2461.69	46772.43	7008.26	0.07	2537.96	9546.28	2690.49	37073.62	20.41
29	Mandsaur	47096.4	5924.83	0	16874.16	69895.39	6713.91	63181.48	62918.73	43.65	3105.12	66067.55	3244.75	6601.06	104.57
30	Morena	50183.87	1569.49	0	18057.95	69811.31	5195.77	64615.54	19963.18	86.34	5881.03	25930.52	6348.42	38217.62	40.13

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
MADHYA PRADESH															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
31	Narsinghpur	104751.62	3201.53	0	15975.25	123928.4	11166.07	112762.33	72947.95	199.66	2347.59	75495.2	2452.96	37161.76	66.95
32	Neemuch	28918.55	2792.12	0	8454.47	40165.14	4016.51	36148.63	34072.98	29.85	1769.05	35871.88	1846.2	2846.5	99.23
33	Niwari	14459.5	1292.7	0	3891.47	19643.67	1523.55	18120.11	11520.12	5.79	1130.38	12656.29	1339.31	5254.88	69.85
34	Panna	47030.15	1424.67	0	6206.71	54661.53	4060.04	50601.49	15770.99	210.94	2477.82	18459.75	2635.57	31983.99	36.48
35	Raisen	79475.6	3545.99	0	10376.31	93397.9	6583.98	86813.92	42627.95	548.18	3417.8	46593.92	3727.52	39910.29	53.67
36	Rajgarh	71614.53	4550.51	0	15698.2	91863.24	5339.02	86524.22	73551.37	11.57	4120.76	77683.72	4534.9	9937.22	89.78
37	Ratlam	54707.36	7371.69	0	22937.37	85016.42	8113.75	76902.67	99438.31	37.38	4450.12	103925.81	6066.1	2377.85	135.14
38	Rewa	44966.31	2007.67	283.37	7324.72	54582.07	4761.11	49820.96	21372.19	185.73	5668.63	27226.55	6185.05	22077.99	54.65
39	Sagar	92434.64	3894.23	0	14470.03	110798.9	8427.56	102371.34	56806.95	80.78	3807.91	60695.66	4089.76	41393.84	59.29
40	Satna	56099.46	2691.5	1151.73	14527.88	74470.57	5452.29	69018.27	39418.38	1084.31	4766.96	45269.69	5077.31	25470.08	65.59
41	Sehore	55598.77	3823.16	0	14546.01	73967.94	6473.35	67494.59	39055.28	117.47	2527.11	41699.87	2714.97	25606.86	61.78
42	Seoni	61319.08	2229.07	2284.48	6595.87	72428.5	4034.98	68393.52	24964.82	4.91	3328.53	28298.24	3532.72	39891.08	41.38
43	Shahdol	53203.74	327.6	1305.53	1133.92	55970.79	2798.53	53172.26	3124.57	1673.31	2307.45	7105.33	2440.47	45933.91	13.36
44	Shajapur	41301.49	3338.58	0	11063.98	55704.05	4235.84	51468.21	52782.83	54.55	2182.07	55019.46	2288.53	2116.74	106.9
45	Sheopur	35367.05	1089.85	0	19374.62	55831.52	5156.95	50674.57	17631.34	44.79	1817.82	19493.95	1968.51	31029.92	38.47
46	Shivpuri	66541.87	3838.62	0	15047.29	85427.78	7107.83	78319.96	48288.67	42.99	4668.71	53000.39	5048.85	24939.43	67.67
47	Sidhi	27340.89	799.27	392.3	2837.24	31369.7	2157.43	29212.27	7552.41	88.26	2908.38	10549.05	3157.52	18414.08	36.11
48	Singrauli	33965.21	838.15	0	2519.96	37323.32	1866.17	35457.15	8979.76	2219.69	2657.3	13856.77	2945.75	21311.92	39.08
49	Tikamgarh	28753.79	2755.05	0	8434.69	39943.53	3514.7	36428.83	26734.19	0	3074.02	29808.19	3746.52	5948.14	81.83
50	Ujjain	72131.6	5918.96	0	21647.62	99698.18	8325.12	91373.06	95485.93	57.77	3895.58	99439.27	4104.22	8999.19	108.83
51	Umaria	34464.53	416.86	659.44	1032.75	36573.58	2334.23	34239.35	4294.94	540.07	1571.36	6406.36	1714.96	27689.39	18.71
52	Vidisha	74063.34	3153.79	0	13676.72	90893.85	5450	85443.85	51046	13.93	3969.72	55029.63	4260.54	30123.4	64.4
	Total(Ham)	**2694541.73**	**161651.93**	**12848.5**	**678366.24**	**3547408.4**	**262033.4**	**3285374.93**	**1740325.63**	**17460.5**	**172240.36**	**1930026.5**	**187742.25**	**1445041.63**	**58.75**
	Total(Bcm)	**26.95**	**1.62**	**0.13**	**6.78**	**35.47**	**2.62**	**32.85**	**17.4**	**0.17**	**1.72**	**19.3**	**1.88**	**14.45**	**58.75**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
MAHARASHTRA															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Ahmednagar	86962.71	13325.98	14393.47	45925.63	160607.79	8100.99	152506.80	114588.35	0.00	6196.74	120785.1	6208.26	42632.77	79.20
2	Akola	28653.40	1473.19	207.45	8693.07	39027.11	2741.76	36285.36	21544.03	0.59	2254.58	23799.20	2375.60	12538.66	65.59
3	Amravati	53675.55	4839.13	1228.12	26844.89	86587.70	6273.28	80314.42	69502.23	0.00	4247.00	73749.28	5082.99	18803.37	91.83
4	Aurangabad	68056.45	7315.56	0.00	31620.12	106992.13	5355.70	101636.43	69352.38	0.00	3462.54	72814.94	3462.48	28821.50	71.64
5	Beed	81954.00	8594.96	6159.28	33297.23	130005.47	6500.25	123505.22	68330.52	39.65	4774.52	73144.76	4774.45	50360.46	59.22
6	Bhandara	32251.00	45075.55	417.80	15965.57	93709.92	6889.61	86820.31	22414.31	171.66	3649.06	26235.03	3649.06	60585.28	30.22
7	Buldhana	65759.62	5246.70	263.73	21549.48	92819.54	4853.05	87966.49	64437.13	0.00	3254.40	67691.65	3365.37	23288.68	76.95
8	Chandrapur	98750.59	5022.28	1471.98	11730.04	116974.89	6072.20	110902.69	14932.60	23.96	17563.49	32520.15	17563.47	78382.55	29.32
9	Dhule	44869.23	7165.66	0.00	20870.14	72905.03	3997.59	68907.44	33816.57	101.10	1756.46	35674.14	1756.46	33475.92	51.77
10	Gadchiroli	94742.17	3666.03	0.00	10617.42	109025.62	6162.19	102863.43	21155.06	1.55	3907.61	25064.28	3907.61	77799.15	24.37
11	Gondia	43144.40	6703.13	645.57	16408.51	66901.61	4534.67	62366.94	10153.58	318.71	5936.50	16408.77	5936.48	45958.17	26.31
12	Hingoli	52689.37	2968.56	7308.43	48217.51	111183.87	5578.66	105605.21	36287.09	2.53	2159.14	38448.77	2159.14	67250.19	36.41
13	Jalgaon	89072.55	6727.70	574.12	46117.48	142491.85	7507.21	134984.64	101248.72	175.27	4887.81	106311.8	4887.79	35036.34	78.76
14	Jalna	58298.04	3067.57	115.46	22711.20	84192.27	4226.41	79965.86	42443.79	68.84	1351.14	43863.77	5694.24	32937.85	54.85
15	Kolhapur	53581.01	10136.48	780.56	71662.02	136160.07	8374.31	127785.76	52167.22	0.00	2079.54	54246.75	2079.54	73539.01	42.45
16	Latur	45714.14	7150.57	0.00	16140.14	69004.85	3459.74	65545.11	33580.73	192.54	2199.63	35972.88	2199.62	30380.77	54.88
17	Nagpur	66123.47	9141.62	2573.37	22630.55	100469.00	5529.59	94939.41	35859.92	354.32	10247.46	46461.66	10247.49	48477.71	48.94
18	Nanded	102027.99	974.83	3718.96	17520.68	124242.46	6215.53	118026.93	34865.24	1.21	3344.05	38210.49	3344.07	79839.66	32.37
19	Nandurbar	42708.01	2843.73	1349.45	8990.28	55891.47	2907.51	52983.97	17183.93	0.00	2991.68	20175.64	2991.68	32827.13	38.08
20	Nashik	132610.54	13567.39	3785.82	48248.67	198212.42	10851.89	187360.53	104646.41	1202.37	3593.64	109442.4	3593.61	84378.50	58.41
21	Osmanabad	61164.17	6447.24	2583.65	15718.09	85913.15	4332.17	81580.98	48272.70	0.79	2315.87	50589.39	2315.85	31161.36	62.01
22	Palghar	18306.25	289.32	0.00	3360.50	21956.07	1398.58	20557.49	3886.53	43.80	973.19	4903.51	973.21	15653.98	23.85
23	Parbhani	58054.77	1785.50	645.43	26071.85	86557.55	4491.13	82066.42	36212.33	0.00	1950.18	38162.49	1950.17	43903.95	46.50
24	Pune	94222.19	19663.71	1192.62	68192.27	183270.79	10636.91	172633.88	112093.74	0.00	8151.54	120245.2	8504.83	60096.93	69.65
25	Raigad	31618.67	408.79	0.00	5510.82	37538.28	1915.10	35623.18	4352.55	0.00	2037.81	6390.37	2037.81	29232.81	17.94
26	Ratnagiri	38659.69	169.31	18.49	2180.49	41027.98	2301.44	38726.54	5386.73	0.00	1313.22	6699.91	1313.25	32026.63	17.30
27	Sangli	53003.49	21603.95	128.40	65489.45	140225.29	8957.41	131267.88	67823.88	0.00	3307.65	71131.54	3346.48	60395.41	54.19
28	Satara	52487.27	19022.28	3734.05	37067.04	112310.64	6867.84	105442.80	60640.59	0.00	4849.88	65490.52	4849.90	39996.20	62.11
29	Sindhudurg	20825.21	196.12	3.83	2232.15	23257.31	1170.52	22086.79	7351.30	0.00	2219.19	9570.46	2219.19	12516.33	43.33
30	Solapur	92306.09	10918.84	2954.03	40096.78	146275.74	7313.83	138961.91	102898.49	2.65	4853.01	107754.2	4853.01	38176.76	77.54
31	Thane	14800.32	288.56	0.00	2231.37	17320.25	964.43	16355.82	2397.66	0.00	720.82	3118.46	720.82	13237.36	19.07
32	Wardha	59795.81	1438.93	1463.96	21063.02	83761.72	4393.14	79368.58	38940.80	118.80	3444.76	42504.43	3444.80	36864.13	53.55
33	Washim	42953.07	2841.84	68.85	12869.21	58732.97	3061.21	55671.76	31438.19	8.51	2069.19	33515.97	2069.20	22155.79	60.20
34	Yawatmal	94609.18	12393.45	5825.78	28057.62	140886.03	7579.68	133306.35	37338.14	23.21	7628.05	44989.36	7628.05	88320.27	33.75
	Total(Ham)	**2074450.42**	**262474.46**	**63612.67**	**875901.29**	**3276438.84**	**181515.52**	**3094923.32**	**1527543.44**	**2852.05**	**135691.36**	**1666087**	**141505.98**	**1481051.58**	**53.83**
	Total(Bcm)	**20.74**	**2.62**	**0.64**	**8.76**	**32.76**	**1.82**	**30.95**	**15.28**	**0.03**	**1.36**	**16.66**	**1.42**	**14.81**	**53.83**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
MANIPUR															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	**Bishnupur**	9572.6	0.06	2257.53	83.68	11913.87	1191.387	10,722.48	327	0	282.96	609.96	290.93	10,104.55	5.69
2	**Churachandpur**	6707.1	0	1510.99	69	8287.09	828.709	7,458.38	270	0	191.11	461.11	192.05	6,996.33	6.18
3	**Imphal East**	11895.89	63.52	2713.54	274.26	14947.21	1494.721	13,452.49	573	12	500.32	1085.32	502.75	12,372.60	8.07
4	**Imphal West**	6297.13	0.01	2327.91	74.33	8699.38	869.938	7,829.44	285	12	568.28	865.28	571.06	6,006.62	11.05
5	**Thoubal**	5799.77	0.02	2075.4	62.27	7937.46	793.746	7,143.71	240	0	463.13	703.13	465.39	6,438.33	9.84
	Total (Ham)	**40272.49**	**63.61**	**10885.37**	**563.54**	**51785.01**	**5178.501**	**46,606.51**	**1695**	**24**	**2005.8**	**3724.8**	**2022.18**	**41,918.43**	**7.99**
	Total (Bcm)	**0.40**	**0.001**	**0.11**	**0.01**	**0.52**	**0.05**	**0.47**	**0.02**	**0.0002**	**0.02**	**0.04**	**0.02**	**0.42**	**7.99**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
MEGHALAYA															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	East Garo Hills	5944.69	574.89	1795.66	669.38	8984.62	898.46	8086.16	0	0	332.03	332.02	368.38	7717.78	4.11
2	East Jaintia Hills	12480.85	91.2	4292.83	88.71	16953.59	1695.37	15258.22	0	0	186.02	186.02	211.46	15046.76	1.22
3	East Khasi Hills	17237.26	386.76	5108.86	380.83	23113.71	2311.38	20802.33	0	2.1	589.56	591.64	673.59	20126.66	2.84
4	North Garo Hills	6013.23	2061.23	1325	568.96	9968.42	1617.61	8350.81	0	0	399.58	399.59	439.32	7911.47	4.79
5	Ri Bhoi	5042.91	133.03	1330.29	114.69	6620.92	662.1	5958.82	0	22.49	307.32	329.81	349.65	5586.68	5.53
6	South Garo Hills	16789.14	49.99	6616	46.25	23501.38	2350.15	21151.23	0	0	246.46	246.47	272.05	20879.17	1.17
7	South West Garo Hills	4684.43	165.38	1857.49	223.29	6930.59	3533.95	3396.64	511.92	0	249.59	761.51	258.33	2626.4	22.42
8	South West Khasi Hills	11468.86	202.88	2625.09	61.02	14357.85	1435.78	12922.07	0	0	132.31	132.32	147.29	12774.77	1.02
9	West Garo Hills	22130.06	398.92	6532.95	674.04	29735.97	13567.7	16168.27	1933.2	0.6	966.69	2900.49	1071.79	13162.68	17.94
10	West Jaintia Hills	7879.86	107.62	3194.72	74.17	11256.37	1125.64	10130.73	0	0	578.86	578.87	667.29	9463.43	5.71
11	West Khasi Hills	22567.36	1316.88	7018.54	803.08	31705.86	3170.59	28535.27	0	0	443.18	443.19	497.18	28038.08	1.55
	Total(Ham)	**132238.65**	**5488.78**	**41697.43**	**3704.42**	**183129.28**	**32368.73**	**150760.55**	**2445.12**	**25.19**	**4431.61**	**6901.93**	**4956.33**	**143333.88**	**4.58**
	Total(Bcm)	**1.32**	**0.05**	**0.42**	**0.04**	**1.83**	**0.32**	**1.51**	**0.02**	**0.0003**	**0.04**	**0.07**	**0.05**	**1.43**	**4.58**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
MIZORAM															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Aizawl	1295.18	0	340.61	0	1635.79	163.58	1472.21	0	0	193.31	193.32	210.21	1261.99	13.13
2	Champhai	1448.21	0	261.16	0	1709.37	170.92	1538.45	0	0	43.4	43.4	45.72	1492.72	2.82
3	Kolasib	2276.22	0	504.44	0	2780.66	278.06	2502.6	0	0	30.43	30.43	33.36	2469.24	1.22
4	Lawngtlai	2958.07	0	289.74	0	3247.81	324.79	2923.02	0	0	99.46	99.47	113.37	2809.64	3.4
5	Lunglei	5011.78	0	468.08	0	5479.86	547.99	4931.87	0	0	187.46	187.46	194.72	4737.15	3.8
6	Mamit	4367.49	0	1241.52	0	5609.01	560.89	5048.12	0	0	97.79	97.79	112.9	4935.21	1.94
7	Saiha	723.99	0	84.81	0	808.8	80.88	727.92	0	0	39.19	39.19	41.84	686.08	5.38
8	Serchhip	785.47	0	116.21	0	901.68	90.18	811.5	0	0	46.78	46.78	49.83	761.67	5.76
	Total(Ham)	**18866.41**	**0**	**3306.57**	**0**	**22172.98**	**2217.29**	**19955.69**	**0**	**0**	**737.82**	**737.84**	**801.95**	**19153.7**	**3.7**
	Total(Bcm)	**0.19**	**0**	**0.03**	**0**	**0.22**	**0.02**	**0.2**	**0**	**0**	**0.01**	**0.01**	**0.01**	**0.19**	**3.7**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
NAGALAND															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Dimapur	18113.25	1339.72	2358.73	99.9	21911.6	2191.17	19720.43	227	1.23	866.27	1094.5	937.33	18554.87	5.55
2	Kiphire	127.82	327.09	56.57	0	511.48	51.15	460.33	0	0	11.07	11.07	11.37	448.95	2.4
3	Kohima	2073.08	1832.68	340.8	95.99	4342.55	434.24	3908.31	0	0.6	227.74	228.34	245.17	3662.54	5.84
4	Longleng	1021.28	333.9	141.57	6.15	1502.9	150.3	1352.6	0	0	11.77	11.77	17.06	1335.54	0.87
5	Mokokchung	4294.87	765	1201.67	3.67	6265.21	626.52	5638.69	0	0	70.71	70.71	70.72	5567.98	1.25
6	Mon	3564.12	284.49	773.54	4.05	4626.2	462.61	4163.59	0	0	153.12	153.12	153.11	4010.47	3.68
7	Peren	3354.89	1678.38	917.28	26.19	5976.74	597.67	5379.07	0	0	85.32	85.33	86.69	5292.37	1.59
8	Phek	539.15	1140.93	163.85	15.33	1859.26	185.93	1673.33	0	0	40.36	40.35	41.64	1631.69	2.41
9	Tuensang	789.97	1871.29	220.51	0.05	2881.82	288.18	2593.64	0	0	96.85	96.85	98.6	2495.04	3.73
10	Wokha	5560	1614.58	1400.05	99.55	8674.18	867.41	7806.77	0	0.54	183.06	183.59	185.19	7621.05	2.35
11	Zunheboto	701.11	812.85	196.18	44.55	1754.69	175.48	1579.21	0	0	64.48	64.49	64.47	1514.72	4.08
	Total(Ham)	**40139.54**	**12000.91**	**7770.75**	**395.43**	**60306.63**	**6030.66**	**54275.97**	**227**	**2.37**	**1810.75**	**2040.12**	**1911.35**	**52135.22**	**3.76**
	Total(Bcm)	**0.4**	**0.12**	**0.08**	**0.004**	**0.6**	**0.06**	**0.54**	**0.002**	**0.00002**	**0.02**	**0.02**	**0.02**	**0.52**	**3.76**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
ODISHA															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Angul	37702.38	9229.59	3946.79	5891.32	56770.08	3785.8	52984.28	22464.85	1177.93	4481.78	28124.55	4916.11	24425.41	53.08
2	Balasore	56580.97	34805.59	17271.26	32040.24	140698.06	11556.32	129141.74	67541.91	1027.65	6417.48	74987.07	6734.34	53837.82	58.07
3	Bargarh	40536.4	12533.97	136.35	12967.88	66174.6	4345.38	61829.22	28921.56	360.23	4336.83	33618.61	4490.12	28295.55	54.37
4	Bhadrak	18039.51	16635.41	4479.06	20330.89	59484.87	5948.49	53536.37	29183.71	338.13	2752.05	32273.9	2883.62	21130.91	60.28
5	Bolangir	44699.75	7310.78	898.79	8270.11	61179.43	4750.85	56428.58	22122.48	256.36	5630.72	28009.54	6244.53	27805.24	49.64
6	Boudh	18001.53	3103.3	449.44	4292.25	25846.52	2124.4	23722.12	9250.2	50.83	1429.59	10730.61	1516.93	12904.17	45.23
7	Cuttack	39157.44	16060.77	9049.06	11533.1	75800.37	6909.9	68890.45	23503.86	875.16	7083.62	31462.64	7400.62	37110.79	45.67
8	Deogarh	20164.27	5587.95	1223.73	6368.55	33344.5	2947.24	30397.26	16206.61	285.09	967.04	17458.75	1009.97	12895.58	57.44
9	Dhenkanal	29034.42	9924.25	5442.13	3913.08	48313.88	3540.21	44773.67	13294.59	340.34	3763.35	17398.3	3895.5	27243.24	38.86
10	Gajapati	12783.46	2061.23	4946.35	2387.83	22178.87	2217.88	19960.99	5336.11	119.34	1714.79	7170.22	1771.04	12734.51	35.92
11	Ganjam	44245.01	27445.92	17236.17	14820.78	103747.88	9170.28	94577.6	25834.17	1600.04	11218.56	38652.81	12092.84	55050.5	40.87
12	Jagatsinghpur	16296.43	16701.24	4390.92	12192.92	49581.51	4851.94	44729.57	22746.73	550.29	2412.09	25709.12	2461.26	18971.29	57.48
13	Jajpur	31920.88	10535.38	7361.3	7844.26	57661.82	4375.75	53286.07	29715.65	587.86	4834.22	35137.74	5010.44	17972.11	65.94
14	Jharsuguda	17006.82	1582.33	221.62	2071.71	20882.48	1555.62	19326.86	6500.27	961.35	2480.16	9941.78	2717.15	9148.1	51.44
15	Kalahandi	45234.65	10257.29	1926.12	9327.9	66745.96	5299.69	61446.27	19917.08	751.4	5021.57	25689.99	5323.94	35453.91	41.81
16	Kandhamal	26668.31	2296.23	4436.19	3114.31	36515.04	2920.26	33594.78	7672.74	172.38	2310.25	10155.36	2396.49	23353.18	30.23
17	Kendrapara	7084.42	4866.88	1847.1	4414.51	18212.91	1481.8	16731.11	9325.86	152.49	1171.84	10650.19	1213.74	6039.02	63.66
18	Keonjhar	55764.43	13732.6	11495.85	10848.16	91841.04	8278.87	83562.16	30359.31	618.8	6244.45	37222.57	6604.91	45979.12	44.54
19	Khurda	23140.47	8311.33	6000.27	9533.9	46985.97	4136.21	42849.75	16908.11	2130.44	7178.11	26216.62	7983.59	17057.95	61.18
20	Koraput	41875.66	4227.1	4155.74	6212.25	56470.75	4391.21	52079.54	7146.82	603.33	4536.2	12286.38	4827.2	39502.17	23.59
21	Malkangiri	26615.31	4422.44	1152.11	4336.71	36526.57	3120.13	33406.44	3514.95	0	2097.66	5612.59	2256.78	27634.72	16.8
22	Mayurbhanj	84291.78	19728.6	18391.17	24836.1	147247.65	10825.41	136422.24	50713.03	223.21	7921.38	58857.64	8297.08	77188.91	43.14
23	Nabarangapur	48129.54	3335.78	3944.31	4206.09	59615.72	5443.41	54172.31	16095.47	159.12	3905.75	20160.33	4141.86	33775.88	37.22
24	Nayagarh	21835.55	4914.78	5223.7	6532.51	38506.54	2958.8	35547.74	12209.09	44.2	3393.89	15647.17	8151.34	19847.95	44.02
25	Nuapada	22938.85	4998.89	706.75	4684.05	33328.54	2699.55	30628.99	16720.94	101.66	1935.48	18758.09	2030.79	11775.58	61.24
26	Puri	30409.99	11283.32	7134.83	17181.49	66009.63	5173.57	60836.05	26813.41	0	5043.69	31857.14	5336.4	28686.21	52.37
27	Rayagada	24570.1	3788.96	4565.28	3003.26	35927.6	2749.22	33178.38	7291.83	718.25	3046.15	11056.21	3199.55	21968.77	33.32
28	Sambalpur	46108.19	7100.81	311.16	11228.76	64748.92	5507.91	59241.01	13365.82	1067.43	3238.56	17671.78	3356.47	41451.3	29.83
29	Subarnapur	18974.02	3614.68	155.55	4570.4	27314.65	2018.67	25295.98	10366.12	59.67	1913.44	12339.26	1988.05	12940.83	48.78
30	Sundargarh	69207.42	8276.05	2487.11	7092.69	87063.27	6266.61	80796.66	24838.82	2236.52	6230.72	33306.05	6671.02	47050.3	41.22
	Total(Ham)	**1019017.96**	**288673.45**	**150986.21**	**276048.01**	**1734725.63**	**141351.38**	**1593374.19**	**595882.1**	**17569.5**	**124711.41**	**738163.01**	**136923.68**	**849231.02**	**46.33**
	Total(Bcm)	**10.19**	**2.89**	**1.51**	**2.76**	**17.35**	**1.41**	**15.94**	**5.96**	**0.18**	**1.25**	**7.39**	**1.37**	**8.49**	**46.33**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
PUNJAB															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Amritsar	29099.88	83283.51	5345.17	30294.65	148023.21	14802.3	133220.91	230451.39	438.41	6391.81	237281.59	6453.16	0	178.11
2	Barnala	12217.41	25795.05	1268.74	16138.89	55420.09	5542	49878.09	108961.74	43.94	2515.45	111521.14	2539.61	0	223.59
3	Bathinda	18559.13	63638.64	3246.33	35254.63	120698.73	12069.89	108628.84	107855.46	347.69	5858.75	114061.9	5915	21623.42	105
4	Faridkot	8450.88	36530.76	960.97	17211.36	63153.97	6315.4	56838.57	70534.83	66.46	2607.05	73208.33	2632.09	0	128.8
5	Fatehgarh Sahib	14525.56	14987.18	1670.85	8164.73	39348.32	3934.83	35413.49	71237.87	2588.59	2530.3	76356.77	2554.59	0	215.61
6	Fazilka	8415.22	45176.88	1206.71	23280.99	78079.8	7807.99	70271.81	48438.84	44.13	5069.51	53552.49	5118.19	31435.32	76.21
7	Firozpur	18481.38	84523.19	2443.07	41727.85	147175.49	14717.55	132457.94	171085.47	134.21	3480.63	174700.31	3514.05	6579.1	131.89
8	Gurdaspur	35836.79	92976.76	6344.47	35258.71	170416.73	16873.56	153543.17	210840.39	110.52	7070.62	218021.5	7138.49	4117.53	141.99
9	Hoshiarpur	45979.34	24531.81	7725.46	9402.09	87638.7	7882.02	79756.69	86971.07	131.51	6676.97	93779.58	6741.1	9742.69	117.58
10	Jalandhar	28762.31	31366.59	4285.85	15713.04	80127.79	8012.79	72115	173831.12	2750.65	13512.39	190094.14	13642.14	0	263.6
11	Kapurthala	18016.2	36189.75	2772.39	10040.41	67018.75	6701.88	60316.87	137922.59	1822.72	3449.31	143194.61	3482.43	0	237.4
12	Ludhiana	37582.37	78611.97	5679.53	37455.88	159329.75	15933	143396.75	293750.94	8200.97	15013.51	316965.39	15157.64	0	221.04
13	Malerkotla	7710.33	8276.57	1054.35	4533.19	21574.44	2157.45	19416.99	56174.26	541.98	1998.2	58714.44	2017.39	0	302.39
14	Mansa	13692.09	33984.15	1850.78	22057.15	71584.17	7158.41	64425.76	60442.22	54.43	3243.2	63739.82	3274.33	14864.11	98.94
15	Moga	17671.46	44509.14	2427.44	18625.44	83233.48	8323.35	74910.13	173419.46	122.01	4157.36	177698.82	4197.28	0	237.22
16	Muktsar	6640	50959.42	1329.55	33781.89	92710.86	9271.07	83439.79	16255.7	73.16	3808.03	20136.86	3844.59	63266.38	24.13
17	Pathankot	12563.17	20589.02	2901.77	11457.11	47511.07	4480.16	43030.91	19213.85	88.87	2845.98	22148.71	2873.3	20854.88	51.47
18	Patiala	38873.34	30147.53	5223.56	18455.3	92699.73	9269.98	83429.75	170481.95	677.87	7982.56	179142.4	8059.22	0	214.72
19	Rupnagar	20001.14	12178.13	3087.2	7487.35	42753.82	3910.11	38843.71	34744.54	656.95	2882.68	38284.16	2910.36	6435.1	98.56
20	Sas Nagar	13808.96	4765.13	2030.85	1966.6	22571.54	2257.15	20314.39	18758.47	3490.03	4160.04	26408.54	4199.99	919.18	130
21	Sbs Nagar	16370.95	27285.72	2216.48	8570.02	54443.17	5286.14	49157.03	57719.22	269.45	2591.67	60580.33	2616.56	2199.58	123.24
22	Sangrur	25945.63	28662.51	3091.36	12989.78	70689.28	7068.93	63620.35	192859.49	1554.64	4980.67	199394.81	5028.49	0	313.41
23	Tarn Taran	22784.91	28117.61	3901	13428.62	68232.14	6823.21	61408.93	126574.22	102.06	4725.03	131401.31	4770.39	0	213.98
	Total(Ham)	**471988.45**	**907087.02**	**72063.88**	**433295.68**	**1884435.03**	**186599.17**	**1697835.87**	**2638525.07**	**24311.24**	**117551.74**	**2780388**	**118680.39**	**182037.29**	**163.76**
	Total(Bcm)	**4.72**	**9.07**	**0.72**	**4.33**	**18.84**	**1.87**	**16.98**	**26.39**	**0.24**	**1.18**	**27.8**	**1.19**	**1.82**	**163.76**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023

RAJASTHAN

S. No.	Name of District	Ground Water Recharge: Monsoon Season: Recharge from rainfall	Ground Water Recharge: Monsoon Season: Recharge from other sources	Ground Water Recharge: Non-monsoon Season: Recharge from rainfall	Ground Water Recharge: Non-monsoon Season: Recharge from other sources	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction: Irrigation	Current Annual Ground Water Extraction: Industrial	Current Annual Ground Water Extraction: Domestic	Current Annual Ground Water Extraction: Total	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Ajmer	28350.64	1938.3	107.28	7562.79	37959.01	3795.9	34163.11	47462.83	176	1184.34	48823.19	1184.35	0	142.91
2	Alwar	71055.06	1061.76	2824.96	4734	79675.78	7967.58	71708.2	113255.21	3413.35	14469.75	131138.28	14469.73	0	182.88
3	Banswara	10143.43	276.91	0	12748.07	23168.41	2316.85	20851.56	11598.17	4.02	2417.18	14019.38	2417.19	6999.66	67.23
4	Baran	39760.35	5153.94	0	20068.11	64982.4	6054.71	58927.68	67411.74	102.57	8364.65	75878.95	8364.65	3291.77	128.77
5	Barmer	35541.7	683.04	74.74	2054.72	38354.2	3835.44	34518.77	37805.31	438	7406.28	45649.61	7406.29	1436.98	132.25
6	Bharatpur	31346.36	1691.88	1028.4	5602.54	39669.18	3402.44	36266.73	37331.9	71.85	6391.83	43795.62	6391.83	0	120.76
7	Bhilwara	31320.03	100.1	0	13689.26	45109.39	4494.81	40614.58	60213.29	735.87	5372.48	66321.65	5372.49	695.27	163.3
8	Bikaner	25174.63	694.75	3238.11	1775.08	30882.57	3012.06	27870.51	28462.85	71	9705.94	38239.79	9705.94	4973.02	137.21
9	Bundi	17768.55	1295.54	0	14001.81	33065.9	2643.75	30422.15	27292.16	66	3723.39	31081.54	3723.39	4746.68	102.17
10	Chittaurgarh	23505.07	1642.48	0	9405.73	34553.28	3455.31	31097.97	46512.33	107.23	2028.21	48647.78	2028.2	123.58	156.43
11	Churu	13980.01	21.8	1479.1	512.82	15993.73	1204.22	14789.51	15419.69	4.76	3185.95	18610.4	3185.95	1988.3	125.84
12	Dausa	24381.35	998.83	180.59	2366.68	27927.45	2792.76	25134.69	47521.68	3.19	11095.15	58620.01	11095.14	0	233.22
13	Dhaulpur	19964	1279.83	1078.04	5187.68	27509.55	2470.04	25039.51	29417.68	15.73	4615.56	34048.97	4615.56	606.35	135.98
14	Dungarpur	9063.13	1338.68	0	12064.61	22466.42	2224.83	20241.59	11227.75	1.11	885.25	12114.12	885.25	8127.47	59.85
15	Ganganagar	4771.87	16249.07	1003.31	25942.51	47966.76	4796.65	43170.1	16989.18	39	38.57	17066.75	38.57	26103.36	39.53
16	Hanumangarh	5212.91	7924.31	1029.84	8323.2	22490.26	2249.05	20241.22	11247.76	200	914.9	12362.66	914.9	7878.56	61.08
17	Jaipur	61524.41	2204.25	1088.9	7769.56	72587.12	7258.72	65328.4	107004.97	1662.63	38927.03	147594.63	38927.03	0	225.93
18	Jaisalmer	8488.83	380.23	538.02	1140.69	10547.77	1054.78	9492.99	30418.32	5.84	3941.1	34365.26	3941.1	0	362.01
19	Jalor	38666.31	1201.21	0	8081.32	47948.84	4166.86	43781.98	75036.44	2.58	4408.2	79447.23	4408.2	272.41	181.46
20	Jhalawar	39717.12	2899.9	0	13010.71	55627.73	5332.33	50295.4	54683.43	0.41	3956.82	58640.65	3956.82	4500.46	116.59
21	Jhunjhunu	21046.63	294.98	1734.62	1474.86	24551.09	2455.11	22095.98	35396.64	564.16	11912.02	47872.82	11912.02	0	216.66
22	Jodhpur	35479.98	994.78	736.55	2993.98	40205.29	3471.68	36733.61	78476.56	677.58	15154.96	94309.12	15154.96	298.22	256.74
23	Karauli	28079.55	472.76	205.27	5060.02	33817.6	3254.58	30563.02	43466.39	0.07	4836.85	48303.32	4836.86	1681.37	158.04
24	Kota	29039.29	3102.49	0	19433.4	51575.18	5157.51	46417.67	40190.84	180.93	8572.76	48944.54	8572.76	5680.3	105.44
25	Nagaur	56744.71	1077.11	1523.73	3330.84	62676.39	6032.61	56643.77	88158.52	1147.65	13604.42	102910.61	13604.42	466.56	181.68
26	Pali	27655.63	467.85	0	4027	32150.48	3215.07	28935.41	41633.64	17.58	4366.05	46017.27	4366.05	1920.74	159.03
27	Pratapgarh	15650.44	170.1	0	6943.7	22764.24	2275.87	20488.37	25665.32	19	643.83	26328.16	643.83	974.18	128.5
28	Rajsamand	8531.5	219.35	18.7	2815.47	11585.02	1158.54	10426.48	10057.26	391.64	2416.81	12865.72	2416.81	554.91	123.39
29	Sawai Madhopur	31728.1	2121.39	0	10378.56	44228.05	4422.8	39805.24	56358.79	0.22	7836.38	64195.43	7836.38	0	161.27
30	Sikar	31523.1	1794.93	1535.21	2046.21	36899.45	3689.92	33209.52	51368.58	221.34	12208.95	63798.89	12208.94	900.19	192.11
31	Sirohi	25608.25	172.5	0	3996.6	29777.35	2977.72	26799.63	29160.36	340.77	1840.64	31341.77	1840.64	889.75	116.95
32	Tonk	29191.09	3843.85	0	11194.13	44229.07	4197.53	40031.53	29959.39	36	10828.93	40824.35	10828.95	3244.39	101.98
33	Udaipur	21418.1	548.72	0	10287.18	32254	3225.43	29028.56	24219.28	2059.79	3449.6	29728.67	3449.61	1582.32	102.41
	Total(Ham)	**901432.13**	**64317.62**	**19425.37**	**260023.84**	**1245198.96**	**120063.46**	**1125135.44**	**1430424.28**	**12777.86**	**230704.79**	**1673907.1**	**230704.81**	**89936.8**	**148.77**
	Total(Bcm)	**9.01**	**0.64**	**0.19**	**2.6**	**12.45**	**1.2**	**11.25**	**14.3**	**0.13**	**2.31**	**16.74**	**2.31**	**0.9**	**148.77**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
SIKKIM															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Gangtok	4685.22	114.05	2164.43	22.8	6986.5	698.65	6287.85	285.1	6.08	102.63	393.81	107.9	5888.77	6.26
2	Gyalshing	2720.72	99.35	954.85	2.96	3777.88	377.79	3400.09	206.1	0	19.2	225.3	19.84	3174.15	6.63
3	Mangan	2337.02	37.6	1497.3	3.36	3875.28	387.53	3487.75	83.6	0	11.96	95.56	12.21	3391.94	2.74
4	Namchi	2487.51	61.35	786.43	5.5	3340.79	334.08	3006.71	136.45	35.5	44.62	216.56	46.25	2788.52	7.2
5	Pakyong	3444.63	48.15	1591.32	9.72	5093.82	509.38	4584.44	120.6	61.2	18.99	200.78	19.96	4382.69	4.38
6	Soreng	882.88	28.15	309.85	2.6	1223.48	122.35	1101.13	62.8	0	16.46	79.26	17.01	1021.32	7.2
	Total(Ham)	**16557.98**	**388.65**	**7304.18**	**46.94**	**24297.75**	**2429.78**	**21867.97**	**894.65**	**102.78**	**213.86**	**1211.27**	**223.17**	**20647.39**	**5.54**
	Total(Bcm)	**0.166**	**0.004**	**0.073**	**0.000**	**0.243**	**0.024**	**0.219**	**0.009**	**0.001**	**0.002**	**0.012**	**0.002**	**0.206**	**5.54**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
TAMIL NADU															
S. No.	Name of District	Ground Water Recharge: Monsoon Season: Recharge from rainfall	Ground Water Recharge: Monsoon Season: Recharge from other sources	Ground Water Recharge: Non-monsoon Season: Recharge from rainfall	Ground Water Recharge: Non-monsoon Season: Recharge from other sources	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction: Irrigation	Current Annual Ground Water Extraction: Industrial	Current Annual Ground Water Extraction: Domestic	Current Annual Ground Water Extraction: Total	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Ariyalur	15860.02	18903.42	2272.86	2066.82	39103.12	3581.87	35521.26	17284.99	70.24	1122.72	18477.96	1246.86	17067.19	52.02
2	Chengalpattu	19068.67	36751.40	5.33	2833.82	58659.22	5590.23	53069.00	36987.70	339.20	747.75	38074.66	1458.47	14488.17	71.75
3	Chennai	7914.34	1367.30	0.00	862.01	10143.65	923.10	9220.55	258.50	1189.50	10305.31	11753.26	10467.44	876.35	127.47
4	Coimbatore	21401.11	22355.35	3143.10	10104.02	57003.58	5359.39	51644.19	42528.58	1233.66	2215.96	45978.19	5887.66	10010.67	89.03
5	Cuddalore	37364.97	43246.89	19184.58	11802.06	111598.50	10486.36	101112.14	62317.57	68.29	2466.65	64852.50	4285.85	41518.54	64.14
6	Dharmapuri	21951.96	13054.29	2676.17	11441.83	49124.25	4912.46	44211.80	42885.56	31.90	756.66	43674.11	1771.38	6163.59	98.78
7	Dindigul	23739.88	24579.03	2717.22	10595.66	61631.79	6080.81	55550.97	61568.75	310.31	1828.97	63708.04	4081.05	9978.06	114.68
8	Erode	13967.21	46766.31	3515.21	10391.69	74640.42	7239.77	67400.65	52686.28	411.51	944.90	54042.71	18347.45	13057.27	80.18
9	Kallakurichchi	18265.42	30785.29	12216.95	9063.33	70330.99	6903.20	63427.79	49324.49	35.30	925.98	50285.78	1753.78	13422.92	79.28
10	Kancheepuram	16417.96	32820.73	0.00	6734.39	55973.08	5241.54	50731.54	24487.29	857.46	301.95	25646.71	939.35	24775.94	50.55
11	Kanniyakumari	7504.50	20153.09	1917.72	4719.35	34294.66	3429.50	30865.15	3716.00	101.36	981.63	4798.94	1187.47	25860.35	15.55
12	Karur	11739.40	18233.20	1543.66	2417.90	33934.16	3278.18	30655.98	29629.06	328.36	427.52	30384.92	1077.81	7621.83	99.12
13	Krishnagiri	18997.70	16829.77	2842.89	10629.65	49300.01	4684.04	44615.97	37671.75	348.50	424.42	38444.68	2084.61	9447.62	86.17
14	Madurai	22424.45	34406.28	3160.80	15814.19	75805.72	7154.62	70235.46	38935.35	4067.92	2938.11	45941.40	4388.96	24544.09	65.41
15	Mayiladuthurai	7066.21	26696.25	125.74	627.37	34515.57	3451.56	31064.01	41449.07	0.00	1301.41	42750.52	2989.41	2004.52	137.62
16	Nagapattinam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	Namakkal	19693.81	26856.51	2626.58	6552.59	55729.49	5542.34	50187.15	53637.57	82.60	6098.85	59818.99	6613.39	9632.11	119.19
18	Perambalur	9119.11	12402.66	766.27	3060.31	25348.35	2534.84	22813.51	24443.07	33.10	480.42	24956.59	854.80	7513.62	109.39
19	Pudukkottai	35069.42	55274.76	4476.72	4450.27	99271.17	9617.22	89653.95	42882.29	503.90	852.50	44238.72	1925.95	44542.07	49.34
20	Ramanathapuram	25996.73	41039.59	4004.34	6632.19	77672.85	7767.31	69905.54	3816.15	89.68	664.64	4570.39	1425.46	64574.36	6.54
21	Ranipet	16889.86	8244.43	2682.69	6552.09	34369.07	3312.24	31056.83	24936.90	1040.26	860.31	26837.48	1528.23	4942.32	86.41
22	Salem	21290.93	28333.52	4004.06	5315.02	58943.53	5779.77	53163.76	70598.13	128.30	1384.34	72110.81	2943.16	10699.02	135.64
23	Sivagangai	27815.22	35302.31	2800.34	1283.75	67201.62	6720.20	60481.40	15655.55	233.40	1428.59	17317.56	2857.65	41734.78	28.63
24	Tenkasi	9920.35	40874.89	3589.95	6214.51	60599.70	6060.00	54539.68	39124.18	179.54	860.57	40164.30	860.57	33100.30	73.64
25	Thanjavur	61366.75	33350.31	3227.83	4571.39	102516.28	10251.70	92264.58	75804.07	684.20	18402.82	94891.09	18926.36	11300.68	102.85
26	The Nilgiris	8091.24	362.84	1279.14	161.24	9894.46	976.11	8918.35	625.50	52.40	188.98	866.86	2762.58	6968.45	9.72
27	Theni	6741.49	16492.54	3875.36	3423.26	30532.65	3053.32	27479.34	20129.21	91.69	646.27	20867.11	876.84	7933.19	75.94
28	Thiruvarur	7719.07	14727.74	372.59	741.22	23560.62	2356.06	21204.56	12706.80	19.95	1282.91	14009.65	3605.92	9018.08	66.07
29	Thoothukudi	19586.82	21975.19	3495.97	12285.44	57343.42	5685.65	51657.77	19248.45	389.40	446.77	20084.60	1501.64	30896.55	38.88
30	Tiruchirappalli	18443.20	51553.93	1918.59	8203.50	80119.22	8011.94	72107.27	52325.68	272.98	719.03	53317.69	9838.01	29629.97	73.94
31	Tirunelveli	27504.12	41017.10	6575.94	8377.77	83474.93	8233.05	75241.87	32059.80	87.24	719.47	32866.52	1213.45	42379.45	43.68
32	Tirupathur	4626.08	3385.16	512.20	3699.96	12223.40	1222.33	11001.07	15570.49	89.69	820.00	16480.16	1901.42	780.32	149.81
33	Tiruppur	16759.57	28962.08	4030.46	10790.80	60542.91	5759.86	54783.05	46857.71	283.09	528.30	47669.01	3104.66	9102.85	87.01
34	Tiruvallur	51255.18	25012.88	29.29	9821.47	86118.82	7562.28	78556.54	40020.76	1141.46	1955.70	43117.93	7141.07	30751.87	54.89
35	Tiruvannamalai	26710.11	70871.27	688.16	24725.98	122995.52	12118.85	110876.66	80995.91	210.10	7711.44	88917.42	7833.23	25342.14	80.19
36	Vellore	5309.44	9882.05	1098.86	4271.24	20561.59	1930.30	18631.29	18198.45	371.56	2390.94	20960.94	2931.12	1676.22	112.50
37	Villupuram	25915.75	48288.27	17570.47	13667.40	105441.89	10336.30	95105.59	81784.20	20.13	2083.21	83887.57	3736.06	14965.05	88.20
38	Virudhunagar	16780.77	34478.61	5326.69	11401.95	67988.02	6374.57	61613.45	34412.34	65.36	487.38	34965.12	487.38	27435.50	56.75
	Total(Ham)	726288.82	1035637.24	130274.73	266307.44	2158508.23	209522.87	1950569.67	1347564.14	15463.53	78703.39	1441730.89	146836.50	685756.01	73.91
	Total(Bcm)	7.26	10.36	1.30	2.66	21.59	2.10	19.51	13.48	0.15	0.79	14.42	1.47	6.86	73.91

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
TELANGANA															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Adilabad	23965.88	23913.06	2035.44	23982.32	73896.70	7174.57	66722.08	15791.74	245.66	2833.68	18871.07	3450.09	47898.81	28.28
2	Bhadradri Kothagudem	52283.03	32305.56	8845.57	14229.78	107663.94	9987.91	97676.14	20583.68	3079.20	4124.61	27787.50	4157.04	72082.36	28.45
3	Hanumakonda	13420.48	17806.36	0.00	18183.61	49410.45	4730.19	44680.30	24519.62	1054.28	1345.60	26919.52	1345.59	18998.03	60.25
4	Hyderabad	768.78	1817.17	285.34	3582.45	6453.74	645.38	5808.35	0.00	190.40	5247.28	5437.69	5734.14	1100.06	93.62
5	Jagtial	17725.69	18607.23	2000.54	17004.60	55338.06	5354.07	49984.01	21121.78	665.48	304.25	22091.71	1609.64	26593.02	44.20
6	Jangaon	14477.91	12649.88	2547.61	9941.69	39617.09	3252.31	36364.81	17680.47	832.86	2016.83	20530.45	2233.66	15845.85	56.46
7	Jayashankar Bhupalapally	19755.11	8473.24	1197.57	15180.49	44606.41	4118.68	40487.75	13880.54	1108.70	627.79	15617.06	636.51	26214.89	38.57
8	Jogulamba Gadwal	8911.14	23026.77	2662.10	17308.06	51908.07	5063.50	46844.53	11053.98	108.07	201.26	11363.43	716.80	35007.41	24.26
9	Kamareddy	31944.14	16903.02	3559.28	17943.57	70350.01	6543.43	63806.54	29407.55	677.25	1072.44	31157.23	2046.25	37799.54	48.83
10	Karimnagar	14539.45	34351.39	2036.46	43899.67	94826.96	9084.17	85742.83	22597.50	844.98	389.63	23832.17	944.61	61837.79	27.79
11	Khammam	30687.21	64711.52	6251.83	38988.87	140639.43	13508.73	127130.71	36020.75	1259.99	3897.20	41177.94	4302.74	86450.82	32.39
12	Komarambheem Asifabad	30435.68	19080.87	2021.33	14872.32	66410.21	6485.86	59924.29	7759.69	533.71	425.06	8718.35	860.72	50868.58	14.55
13	Mahabubabad	30722.16	14719.84	411.68	17533.14	63386.82	6338.89	57047.86	26451.34	1480.90	1223.38	29155.70	1593.33	27727.09	51.11
14	Mahabubnagar	13712.85	8493.58	2664.62	12331.38	37202.43	3572.92	33629.47	18996.77	678.96	108.00	19783.78	1746.53	13230.59	58.83
15	Mancherial	33154.33	27518.23	1509.95	38921.37	101103.88	9817.95	91285.99	17837.17	2444.04	562.05	20843.26	681.92	67840.35	22.83
16	Medak	19758.98	12135.67	2482.22	17651.83	52028.70	5139.08	46889.72	20442.48	950.44	673.54	22066.07	1376.18	24499.80	47.06
17	Medchal Malkajgiri	4454.02	2487.01	956.46	1964.19	9861.68	982.53	8879.21	3028.80	1309.69	957.53	5296.13	3595.71	3943.35	59.65
18	Mulug	27583.50	12961.26	2078.39	15195.80	57818.96	5731.02	52087.93	11512.67	82.26	543.04	12137.97	822.51	37779.54	23.30
19	Nagarkurnool	27796.73	24791.41	7535.70	35887.15	96010.99	9329.91	86681.14	32790.57	352.61	885.22	34028.44	1745.52	52740.47	39.26
20	Nalgonda	33704.71	52040.10	8784.34	59091.18	153620.33	14730.02	138890.26	48147.21	4097.30	5173.53	57418.04	5173.53	83388.72	41.34
21	Narayanpet	10462.68	10543.50	2009.57	8880.32	31896.07	3123.05	28773.10	10839.27	376.47	127.63	11343.35	1117.56	16830.80	39.42
22	Nirmal	26747.08	19784.99	2126.74	18609.95	67268.76	6255.14	61013.61	17742.38	690.00	990.86	19423.32	1321.43	41334.03	31.83
23	Nizamabad	36182.61	26496.11	3458.20	40567.56	106704.48	9774.89	96929.62	50081.43	363.46	2763.98	53208.86	4197.91	36881.00	54.89
24	Peddapalle	16365.72	34019.73	1137.04	28464.68	79987.17	7801.64	72185.55	17495.02	795.76	951.16	19242.00	1572.12	52656.39	26.66
25	Rajanna Siricilla	12006.52	15770.42	2184.97	16817.13	46779.04	4290.19	42488.85	27056.89	1066.23	58.96	28182.06	226.63	14276.93	66.33
26	Rangareddy	26148.94	15117.16	6465.24	24000.44	71731.78	6863.73	64868.04	30103.03	1008.11	2895.99	34006.46	4354.45	30850.74	52.42
27	Sangareddy	29188.85	5132.44	4649.26	5872.17	44842.72	4073.88	40768.90	15689.53	1483.19	2162.71	19335.31	2812.16	21989.45	47.43
28	Siddipet	21790.34	21202.20	3978.85	20351.74	67323.13	6309.30	61013.81	37104.88	823.30	328.07	38256.53	341.08	22968.08	62.70
29	Suryapet	25497.25	66860.97	3750.24	60306.77	156415.23	15566.35	140848.91	22714.25	1040.00	1551.20	25305.44	2027.76	115266.49	17.97
30	Vikarabad	21087.21	13574.71	2654.99	16267.33	53584.24	5358.57	48225.62	17061.97	339.24	511.02	17912.36	1697.11	30144.02	37.14
31	Wanaparthy	8560.73	27413.84	1976.72	32026.13	69977.42	6762.53	63214.89	20830.70	256.75	233.10	21320.57	1173.17	41019.93	33.73
32	Warangal	11947.08	22906.56	1764.97	15895.28	52513.89	5008.81	47505.02	24876.31	1231.74	901.17	27009.20	1418.07	20852.97	56.86
33	Yadadri Bhuvanagiri	19417.99	35063.48	4444.56	33643.90	92569.93	8877.81	83692.14	33236.21	3924.58	2560.83	39721.64	2900.15	46314.22	47.46
	Total(Ham)	**715204.79**	**742679.28**	**100467.79**	**755396.87**	**2313748.73**	**221657.00**	**2092091.98**	**724456.18**	**35395.61**	**48648.59**	**808500.61**	**69932.62**	**1283232.12**	**38.65**
	Total(Bcm)	**7.15**	**7.43**	**1.00**	**7.55**	**23.14**	**2.22**	**20.92**	**7.24**	**0.35**	**0.49**	**8.09**	**0.70**	**12.83**	**38.65**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
TRIPURA															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	**Dhalai**	12147.64	941.03	6030.48	565.64	19684.79	4296.73	15388.06	135.3	0	939.91	1075.22	1012.2	14240.54	6.99
2	**Gomati**	13884.71	3321.95	4150.69	603.54	21960.89	4077.02	17883.87	164.19	0.96	893.27	1058.41	935.36	16783.37	5.92
3	**Khowai**	6212.26	1790.19	2928.53	596.38	11527.36	1443.58	10083.78	327.71	2.4	653.49	983.59	679.51	9074.17	9.75
4	**North Tripura**	7025.08	583.28	3824.23	704.7	12137.29	3638.62	8498.67	32.4	3.21	993.96	1029.58	1052.88	7410.17	12.11
5	**Sepahijala**	10650.71	3032.8	4176.73	1109.7	18969.94	3812.73	15157.21	761.2	1.68	1015.62	1778.47	1056.06	13338.3	11.73
6	**South Tripura**	16551.36	2948.1	4356.09	1335.74	25191.29	5177.23	20014.06	295.3	2.57	944.37	1242.2	988.86	18727.38	6.21
7	**Unakoti**	5280.53	1119.49	2899.46	432.73	9732.21	1501.75	8230.46	16.05	1.17	662.73	679.96	702.01	7511.22	8.26
8	**West Tripura**	9189.41	2313.76	3712.76	1379.91	16595.84	2446.68	14149.16	773.19	16.66	2211.48	3001.32	2315.68	11043.65	21.21
	Total(Ham)	**80941.7**	**16050.6**	**32078.97**	**6728.34**	135799.61	**26394.34**	**109405.27**	**2505.35**	**28.65**	**8314.84**	**10848.75**	**8742.56**	**98128.8**	**9.92**
	Total(Bcm)	**0.81**	**0.16**	**0.32**	**0.07**	**1.36**	**0.26**	**1.09**	**0.03**	**0.0003**	**0.08**	**0.11**	**0.09**	**0.98**	**9.92**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
UTTAR PRADESH															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Agra	37965.83	15903.1	547.66	34875.73	89292.32	8337.83	80954.49	83152.89	164.01	10897.89	94214.78	11662.91	4955.08	116.38
2	Aligarh	47244.28	16203.69	1597.97	33398.48	98444.42	8219.29	90225.13	60372.56	512.92	11667.78	72553.24	12629.69	19961.74	80.41
3	Ambedkar Nagar	51881.73	11826.45	387.87	15293.99	79390.04	7595.04	71795	38897.45	17.7	6304.17	45219.33	6670.83	26209.01	62.98
4	Amethi	38921.89	20870.39	891.9	26732.36	87416.54	7595.25	79821.29	46499.69	133.04	4942.25	51575	5243.71	27944.83	64.61
5	Amroha	58557.15	6256.17	2150.33	13712.52	80676.17	7309.67	73366.5	61661.15	836.58	4812.36	67310.1	5188.02	9285.09	91.75
6	Auraiya	27295.04	12563.11	286.67	26283.36	66428.18	6642.82	59785.36	30632.69	8.14	2912.67	33553.51	3041.69	26102.83	56.12
7	Ayodhya	48690.72	15531.38	447.72	29141.53	93811.35	9381.15	84430.2	45657.59	52.58	7117.68	52827.85	7822.51	30897.51	62.57
8	Azamgarh	72902.71	24631.24	136.21	36650.35	134320.51	11287.49	123033.02	61649.02	7.1	13572.22	75228.33	14836.82	46540.09	61.14
9	Bagpat	16395.8	7820.99	945.23	12116.4	37278.42	3727.84	33550.58	30024.02	43.23	2517.99	32585.21	2597.17	3880.84	97.12
10	Bahraich	81662.27	21912.34	2945.77	37261.64	143782.02	9524.66	134257.36	70723.9	131.4	9692.09	80547.41	10470.83	52931.19	59.99
11	Ballia	50141.86	15037.45	1799.62	23585.65	90564.58	7052.25	83512.33	45071.15	9.02	8125.49	53205.63	8772.29	29659.88	63.71
12	Balrampur	58790.79	11405.14	1398.21	19472.38	91066.52	6954.6	84111.92	43674.41	284.68	6157.91	50117.01	6750.02	33402.8	59.58
13	Banda	49322.1	8712.25	519.8	14079.69	72633.84	6197.71	66436.13	39960.02	0	3962.62	43922.63	4256.96	22219.16	66.11
14	Barabanki	69830.08	45243.9	1121.58	85684.29	201879.85	19115.12	182764.73	106367.98	40.06	8968.36	115376.4	9670.51	66686.18	63.13
15	Bareilly	70400.18	20081.26	1401.51	31485.65	123368.6	9753.42	113615.18	67591.02	446.44	13333.52	81371.01	14209.9	33754.48	71.62
16	Basti	66457.64	4196.25	662.66	11343.53	82660.08	7219.82	75440.26	42819.04	209.08	6484.2	49512.33	6902.14	25509.99	65.63
17	Bijnor	90559.63	18437.04	3865.7	32456.01	145318.38	11877.85	133440.53	87196.22	790.19	7897.14	95883.56	8345.53	37108.59	71.85
18	Budaun	65960.27	6303.44	1631.21	10379.23	84274.15	7675.58	76598.57	55094.37	59.24	8506.12	63659.74	9105.51	14193.96	83.11
19	Bulandshahar	45581.95	43937.2	1160.71	68903.29	159583.15	14520.38	145062.77	131950.57	0	6678.17	138628.73	6972.13	14719.37	95.56
20	Chandauli	30753.45	16033.36	285.55	9124.28	56196.64	5521.14	50675.5	23197.45	0	4632.21	27829.66	4896.29	22581.76	54.92
21	Chitrakoot	30711.78	5551.8	305.36	7690.59	44259.53	4029.85	40229.68	30537.93	0	2579.95	33117.87	2834.09	6857.67	82.32
22	Deoria	49519.33	43812.39	1534.42	50540.84	145406.98	11791.72	133615.26	76152.64	0	7127.65	83280.31	7468.53	49994.07	62.33
23	Etah	27021.27	16466.83	530.17	38333.6	82351.87	6833.9	75517.97	50452.98	25.77	4606.85	55085.61	4840.12	20199.11	72.94
24	Etawah	27469.38	15078.32	313.59	28277.08	71138.37	6528.27	64610.1	29222.45	160.77	3235.19	32618.39	3431.04	31795.86	50.48
25	Farrukhabad	28940.09	3812.64	492.27	11402.25	44647.25	4464.73	40182.52	25807.91	0	3974.18	29782.09	4244.47	10130.14	74.12
26	Fatehpur	60547.59	21943.4	276.01	32781.18	115548.18	11554.83	103993.35	67962.88	2.02	7339.35	75304.26	7940.09	30474.16	72.41
27	Firozabad	31384.29	16069.75	449.69	32702.03	80605.76	8060.59	72545.17	69234.6	0.01	6714.68	75949.29	7151.21	9145.73	104.69
28	G.B.Nagar	15885.55	14188.32	401.64	21944.93	52420.44	5242.05	47178.39	47888.36	0	1552.14	49440.49	1602.73	2539.6	104.79
29	Ghaziabad	14514.13	10362.64	539.38	16259.15	41675.3	4167.54	37507.76	36881.78	2246.1	7063.48	46191.34	7937.73	1685.94	123.15
30	Ghazipur	57888.25	17539.52	445.32	28777.51	104650.6	9718.46	94932.14	49221.36	54.3	6905.93	56181.55	7362.55	38293.99	59.18
31	Gonda	77715.12	15965.74	1186.83	24866.58	119734.27	8862.72	110871.55	56400.31	488.51	9753.15	66641.95	10644.32	43338.44	60.11
32	Gorakhpur	69982.06	66123.77	2046.4	31616.39	169768.62	14376.46	155392.16	87020.02	2111.94	9412.26	98544.26	9998.11	56262.05	63.42
33	Hamirpur	32528.81	5863.36	84.22	6805.73	45282.12	4528.23	40753.89	25205.23	343.47	2193.8	27742.5	2268.15	12937.05	68.07
34	Hapur	17763.39	12782.22	647.33	19294.51	50487.45	4531.13	45956.32	45031.95	0	3.39	45035.34	3.56	1638.42	98
35	Hardoi	92431.54	29991.19	2042.14	50035.05	174499.92	16188.22	158311.7	89451.45	76.41	8614	98141.86	9183.18	59600.66	61.99
36	Hathras	18853.27	19243.38	442.05	32302.38	70841.08	5580.58	65260.5	57057.7	28.64	4146.14	61232.5	4390.96	8780.51	93.83
37	Jalaun	65650.98	12105.01	513.29	26382.84	104652.12	10465.23	94186.89	47635.33	7.3	4316.04	51958.68	4509.25	42035.01	55.17
38	Jaunpur	71785.81	20334.77	214.94	37197.96	129533.48	11710.07	117823.41	70450.69	0	13572.02	84022.71	14572.66	32800.07	71.31
39	Jhansi	29482.6	17751.38	0	23923.22	71157.2	6499.53	64657.67	40441.47	40.15	3189.47	43671.07	3439.34	20736.74	67.54
40	Kannauj	26050.71	10464.77	675.64	23749.33	60940.45	6094.06	54846.39	36787.93	15.79	4396.49	41200.25	4685.36	18773.43	75.12
41	Kanpur Dehat	41564.56	12556.86	684.58	25768.47	80574.47	7362.04	73212.43	49810.86	402.82	4049.65	54263.34	4202.93	18795.8	74.12
42	Kanpur Nagar	42677.77	13990.1	918.52	29910.55	87496.94	7705.5	79791.44	53988.75	385.67	7992.27	62366.66	8284.77	17132.27	78.16
43	Kasganj	28888.68	13193.69	557.66	32700.42	75340.45	6298.9	69041.55	42702.47	3.65	4000.13	46706.23	4325.08	22010.37	67.65
44	Kaushambi	29840.98	7611.03	271.18	11989.62	49712.81	4971.3	44741.51	32025	0	4540.43	36565.42	4995.9	9145.56	81.73
45	Kushi Nagar	46718.28	69136.54	2263.39	54208.55	172326.76	17232.7	155094.06	69450.17	1237.54	8689.64	79377.32	9454.67	74951.72	51.18
46	Lakhimpur Kheri	138123.91	33591.43	4730.12	54036.17	230481.63	20451.81	210029.82	115315.84	225.55	12140.68	127682.08	13690.09	80798.32	60.79
47	Lalitpur	16090.56	6145.48	0	18616.47	40852.51	4085.27	36767.24	27664.81	0	3456.04	31120.85	3775.9	5326.53	84.64

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
UTTAR PRADESH															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
48	Lucknow	37675.7	15965.98	829.93	24735.76	79207.37	5717.83	73489.54	29879.96	6110.33	12469.87	48460.16	13872.83	24854.34	65.94
49	Mahoba	9564.34	9202.15	0	11988.24	30754.73	2797.19	27957.54	24406.7	2.01	1157.36	25566.08	1212.54	3346.56	91.45
50	Mahrajganj	66689.03	19836.15	1967.16	22902.63	111394.97	9141.22	102253.75	56831.29	7.7	7102.51	63941.51	7698.58	37716.19	62.53
51	Mainpuri	35335.92	20074.09	420.64	36080.26	91910.91	7977.98	83932.93	55422.01	1.06	4972.56	60395.61	5240.74	24930.57	71.96
52	Mathura	34937.7	34116.1	792.68	68325.58	138172.06	11412.38	126759.68	83916.46	114.23	6498.49	90529.17	6972	37103.44	71.42
53	Maunath Bhanjan	30993.97	8763.34	458.75	10907.44	51123.5	4493.58	46629.92	23744.21	7.36	6379.68	30131.23	7033.82	15844.54	64.62
54	Meerut	42153.18	15451.34	1783.44	23568.23	82956.19	7552.92	75403.27	47442.24	1304.2	9515.72	58262.16	9910.16	19195.23	77.27
55	Mirzapur	25556.47	16119.19	57.63	19459.4	61192.69	5412.94	55779.75	28124.47	40.71	6810.43	34975.63	7319.87	20331.2	62.7
56	Moradabad	36268.75	12052.42	1106.96	16636.63	66064.76	5764.43	60300.33	42545.4	223.21	10682.86	53451.47	11804.71	10027.51	88.64
57	Muzaffarnagar	43675.33	23665.46	3128.13	40398.18	110867.1	6666.32	104200.78	72329.04	341.38	6808.28	79478.72	7363.97	25321.28	76.27
58	Pilibhit	66500.48	15717.95	1250.07	28423.45	111891.95	8197.07	103694.88	61600	164.68	5411.95	67176.62	5768.94	36161.28	64.78
59	Pratapgarh	60943.12	31519.43	203.23	45789.96	138455.74	12033.55	126422.19	91157.06	32.85	8210.97	99400.89	8699.65	26560.49	78.63
60	Prayagraj	73165.81	28765.65	0	39394.2	141325.66	12904.13	128421.53	75451.95	1606.26	17040.33	94098.54	18139.56	35328.78	73.27
61	Raibareli	54907.22	26131.73	225.36	41164.23	122428.54	10603.1	111825.44	58540.32	12.01	7101.83	65654.17	7673.42	45599.66	58.71
62	Rampur	42713.42	12399.03	1571.16	20126.69	76810.3	6474.1	70336.2	47015.01	299.45	5193.12	52507.57	5579.04	17442.69	74.65
63	Saharanpur	75855.33	21834.81	5463.56	37251.19	140404.89	9132.79	131272.1	123985.56	817.66	7281.19	132084.43	7702.09	15869.83	100.62
64	Sambhal	38075.84	3366.8	929.64	5471.97	47844.25	4577.13	43267.12	31535.6	494.47	5732.43	37762.49	6263.01	5052.96	87.28
65	Sant Kabir Nagar	42340.85	4018.87	764.46	7062.22	54186.4	5105.99	49080.41	26542.47	172.97	4322.7	31038.17	4631.67	17733.27	63.24
66	Sant Ravidas Nagar	16773.95	22080.41	184.7	46997	86036.06	8366.84	77669.22	58416.61	80.3	3478.76	61975.68	3648.85	15523.46	79.79
67	Shahjahanpur	86711.32	17662.93	2690.75	25362.56	132427.56	8412.6	124014.96	69274.2	1639.25	8526.36	79439.81	9322.62	43778.9	64.06
68	Shamli	21882.42	9051.43	1544.69	13746.32	46224.86	3189.53	43035.33	41103.54	394.47	3033.93	44531.93	3066.96	1000.2	103.48
69	Shrawasti	43057.31	4603.41	1187.29	7103.28	55951.29	4432.06	51519.23	26203.57	0	3237.06	29440.62	3632.46	21683.2	57.14
70	Siddharth Nagar	68612.81	10439.92	1324.31	15706.7	96083.74	9207.18	86876.56	47636.17	0.34	7366.84	55003.3	8079.37	31160.72	63.31
71	Sitapur	95088.42	39901.44	2012.06	63277.31	200279.23	18085.06	182194.17	80780.35	17352.1	11259.84	109392.3	12255.85	71805.87	60.04
72	Sonbhadra	15380.48	30026.53	129.25	11829.78	57366.04	5514.93	51851.11	21249.33	830.19	4315.1	26394.62	4730.88	25040.7	50.9
73	Sultanpur	47274.06	18704.21	174.63	26405.26	92558.16	7718.02	84840.14	46135.58	5.81	6177.35	52318.77	6567.92	32130.79	61.67
74	Unnao	62175.05	45294.97	966.14	62790.02	171226.18	14969.77	156256.41	87098.17	74.37	8623.82	95796.34	9372.65	59711.23	61.31
75	Varanasi	28751.27	9512.63	123.08	14607.17	52994.15	5027.04	47967.11	31394.08	114.06	10599.38	42107.54	10946.31	8968.05	87.78
	Total(Ham)	**3572405.61**	**1400860.85**	**78039.72**	**2131605.42**	**7182911.6**	**625732.28**	**6557179.32**	**4091757.41**	**43845.24**	**504058.56**	**4639661.2**	**541792.72**	**2003946.54**	**70.76**
	Total(Bcm)	**35.72**	**14.01**	**0.78**	**21.32**	**71.83**	**6.26**	**65.57**	**40.92**	**0.44**	**5.04**	**46.4**	**5.42**	**20.04**	**70.76**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
UTTARAKHAND															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Dehradun	54373.43	1279.11	2937.08	1832.73	60422.35	6042.24	54380.11	10438.49	639.84	6402.94	17481.26	6402.94	36898.85	32.15
2	Haridwar	28334.15	5962.02	3519.38	9149.63	46965.18	3463.49	43501.69	21944.88	3447.6	3055.6	28448.08	3287.61	14821.61	65.4
3	Nainital	6279.71	5109.6	1601.95	5772.9	18764.16	1374.41	17389.75	4154.93	1591.74	3862.39	9609.05	3862.39	7780.7	55.26
4	Udhamsingh Nagar	41810.72	16755.35	2439.48	14890.09	75895.64	6473.75	69421.89	30022.72	6118.67	3795.27	39936.67	3846.94	29433.55	57.53
	Total(Ham)	**130798.01**	**29106.08**	**10497.89**	**31645.35**	**202047.33**	**17353.89**	**184693.44**	**66561.02**	**11797.84**	**17116.2**	**95475.06**	**17399.88**	**88934.71**	**51.69**
	Total(Bcm)	**1.31**	**0.29**	**0.1**	**0.32**	**2.02**	**0.17**	**1.85**	**0.67**	**0.12**	**0.17**	**0.95**	**0.17**	**0.89**	**51.69**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
WEST BENGAL															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	**Alipurduar**	108380.76	1129.37	21452.15	3720.79	134683.07	13468.33	121214.74	9366.1	161.99	3386.22	12914.32	3688.97	107997.67	10.65
2	**Bankura**	108112.58	16418.21	24870.58	28068.08	177469.45	14751.93	162717.52	50234.5	281.43	8620.58	59136.55	8983.35	104012.51	36.34
3	**Birbhum**	79139.98	8698.59	15231.27	16682.04	119751.88	10960.74	108791.14	24501.5	1306.14	8439.61	34247.24	8967.96	74015.57	31.48
4	**Dakshin Dinajpur**	65498.56	9179.63	12931.9	25943.2	113553.29	10101.86	103451.43	58067.8	172.93	3926.17	62166.92	4075.12	41135.56	60.09
5	**Darjiling**	34042.06	669.29	6278.83	995.72	41985.9	4198.6	37787.3	2132.7	420.92	3359.09	5912.72	3731.61	31502.07	15.65
6	**Haora**	15818.41	896.76	3325.09	1399.02	21439.28	1752.75	19686.52	1248	340.9	2652.56	4241.47	3101.86	14995.76	21.55
7	**Hugli**	80826.03	9604.44	16644.65	23542.43	130617.55	12664.68	117952.86	50788.6	2078.09	10516.29	63382.98	11180.2	54252.89	53.74
8	**Jalpaiguri**	147175.46	1952.77	30717.68	5401.85	185247.76	18524.78	166722.97	12700.5	1482.43	6249.22	20432.12	8768.07	143772.01	12.26
9	**Jhargram**	74041.16	4441.66	15109.92	9454.55	103047.29	7819.31	95227.98	20429.6	250.5	2791.08	23471.17	2909.91	71637.98	24.65
10	**Kalimpong**	3156.89	189.21	473.47	98.37	3917.94	391.8	3526.14	0	2.45	62.33	64.77	62.82	3460.88	1.84
11	**Koch Bihar**	142420.16	9098.87	30837	31483.46	213839.49	21383.95	192455.54	79018.8	92.76	6883.64	85995.17	7285.72	106058.28	44.68
12	**Kolkatta**						0	0	0	0	0	0	0	0	0
13	**Malda**	80623.54	7134.43	13220.64	16329.5	117308.11	9891.17	107416.94	27805.5	260.65	10146.18	38212.3	11251.12	68099.7	35.57
14	**Murshidabad**	121052.83	14343.84	27520.69	40111.42	203028.78	16881.38	186147.4	90904.8	419.88	17932.17	109256.84	25470.77	74558.91	58.69
15	**Nadia**	97688.32	21137.11	22470.15	48156.69	189452.27	17889.55	171562.72	135236	457.49	11358.05	147051.53	12202.95	23666.3	85.71
16	**North 24 Parganas**	79235.18	14870.27	19096.05	41920.21	155121.71	11584.11	143537.6	84074.2	560.5	12826.78	97461.44	14196.58	44706.37	67.9
17	**Paschim Barddhaman**	16589	1922.65	3513.51	3311.51	25336.67	2296.89	23039.78	2602.84	4395.17	4891.18	11889.19	5288	10910.41	51.6
18	**Paschim Medinipur**	155954.34	13414.73	33401.81	39796.46	242567.34	23291.22	219276.12	103186.4	1202.09	11711.68	116100.16	12307.79	102645.78	52.95
19	**Purba Barddhaman**	121817.9	17338.63	25331.09	39055.36	203542.98	18439.51	185103.46	83940.2	999.18	11259.79	96199.14	11788.76	89847.56	51.97
20	**Purba Medinipur**	45870.98	3077.86	10246.14	7920.14	67115.12	6711.52	60403.6	17103.2	7.39	4799.9	21910.51	5247.87	38045.11	36.27
21	**Puruliya**	34375.56	8787.68	5742.81	10513.97	59420.02	5803.12	53616.9	2001.2	109.86	7141.56	9252.62	7635.53	43870.32	17.26
22	**South 24 Parganas**						**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
23	**Uttar Dinajpur**	79109.5	6775.3	15478.61	19374.91	120738.32	10309.27	110429.05	43425.1	328.9	7989.97	51743.98	8742.15	57932.89	46.86
	Total(Ham)	**1690929.2**	**171081.3**	**353894.04**	**413279.68**	**2629184.22**	**239116.47**	**2390067.71**	**898767.54**	**15331.62**	**156944.04**	**1071043.1**	**176887.11**	**1307124.53**	**44.81**
	Total(Bcm)	**16.91**	**1.71**	**3.54**	**4.13**	**26.29**	**2.39**	**23.9**	**8.99**	**0.15**	**1.57**	**10.71**	**1.77**	**13.07**	**44.81**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
ANDAMAN & NICOBAR ISLANDS															
		Ground Water Recharge							Current Annual Ground Water Extraction						
		Monsoon Season		Non-monsoon Season											
3	Name of District	Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Irrigation	Industrial	Domestic	Total	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	**N & M Andaman**	8894.86	9.65	7481.5	2.41	16388.42	1638.86	14749.56	0.8	83.24	254.91	338.96	269.19	14396.32	2.3
2	**Nicobar**	14917.07	0.96	19746.09	0.24	34664.36	3466.44	31197.92	0.25	0.95	85.88	87.04	90.68	31106.07	0.28
3	**South Andaman**	5974.52	10.31	4802.74	2.57	10790.14	1079	9711.14	10.65	13.61	314.04	338.28	331.62	9355.28	3.48
	Total(Ham)	**29786.45**	**20.92**	**32030.33**	**5.22**	**61842.92**	**6184.3**	**55658.62**	**11.7**	**97.8**	**654.82**	**764.28**	**691.49**	**54857.67**	**1.37**
	Total(Bcm)	**0.298**	**0.0002**	**0.320**	**0.0001**	**0.618**	**0.062**	**0.557**	**0.0001**	**0.001**	**0.007**	**0.008**	**0.007**	**0.549**	**1.37**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
CHANDIGARH															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Chandigarh	965.08	1390.87	313	2710.52	5379.47	538	4,841.52	826.2	217.66	2606.95	3650.81	2,606.95	1,190.71	75.41
	Total(Ham)	**965.08**	**1390.87**	**313**	**2710.52**	**5379.47**	**538**	**4,841.52**	**826.2**	**217.66**	**2606.95**	**3650.81**	**2,606.95**	**1,190.71**	**75.41**
	Total(Bcm)	**0.010**	**0.014**	**0.003**	**0.027**	**0.054**	**0.005**	**0.048**	**0.008**	**0.002**	**0.026**	**0.037**	**0.026**	**0.012**	**75.41**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
DADRA & NAGAR HAVELI															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Dadra Nagar Haveli	5810.58	661.93	329.73	1948.12	8750.36	579.49	8170.87	888.62	8565.98	1292.4	10747	1798.23	732.06	131.53
	Total(Ham)	**5810.58**	**661.93**	**329.73**	**1948.12**	**8750.36**	**579.49**	**8170.87**	**888.62**	**8565.98**	**1292.4**	**10747**	**1798.23**	**732.06**	**131.53**
	Total(Bcm)	**0.06**	**0.01**	**0.03**	**0.02**	**0.09**	**0.01**	**0.08**	**0.01**	**0.09**	**0.01**	**0.11**	**0.02**	**0.01**	**131.53**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
DAMAN & DIU															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Daman	2822.95	41.21	0	71.91	2936.07	146.81	2789.26	215.1	4215.38	0	4430.48	1412.67	0	158.84
2	Diu	549.48	14.13	0	23.09	586.7	29.33	557.37	42.2	1239.89	0	1282.09	175.69	0	230.02
	Total(Ham)	**3372.43**	**55.34**	**0**	**95**	**3522.77**	**176.14**	**3346.63**	**257.3**	**5455.27**	**0**	**5712.57**	**1588.36**	**0**	**170.7**
	Total(Bcm)	**0.030**	**0.001**	**0**	**0.001**	**0.035**	**0.002**	**0.033**	**0.003**	**0.055**	**0**	**0.057**	**0.016**	**0**	**170.7**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023

JAMMU & KASHMIR

S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Anantnag	4892.06	7761.42	12963.08	2013.1	27629.66	2762.96	24866.7	420.8	34.83	5098.32	5553.95	5098.32	19312.75	22.33
2	Bandipora	184.65	516.14	598.1	9.3	1308.19	130.82	1177.37	21.02	3.5	345.28	369.81	428.61	724.23	31.41
3	Baramulla	9157.5	19690.9	28836.22	6688.11	64372.73	6437.27	57935.46	714.82	20.9	7295.33	8031.05	7295.33	49904.41	13.86
4	Budgam	2604.32	18610.8	6605.85	3618.81	31439.78	3143.98	28295.8	188.96	29.3	5686.99	5905.25	5686.99	22390.55	20.87
5	Doda	96.31	661.15	187.19	161.07	1105.72	110.58	995.14	157.65	17.6	296.11	471.36	364.66	455.23	47.37
6	Ganderbal	107.76	528.9	273.35	287.82	1197.83	119.79	1078.04	420.48	10.43	126.14	557.06	553.82	93.3	51.67
7	Jammu	40664.23	41281.3	12172.41	7990.22	102108.16	8409.27	93698.89	19123.4	2848.21	10469.11	32440.72	10911.64	60815.64	34.62
8	Kathua	18699.68	13411.33	5710.04	10059.18	47880.23	4788.04	43092.19	4576.46	1292.98	7283.68	13153.11	7350.27	29872.49	30.52
9	Kishtwar	188.76	745	366.87	390	1690.63	169.07	1521.56	31.5	14	185.31	230.81	185.31	1290.75	15.17
10	Kulgam	1072.05	7787.4	2840.75	2121.38	13821.58	1382.16	12439.42	147.28	29.16	1776.81	1953.25	1776.81	10486.17	15.7
11	Kupwara	3329.04	17403.2	10783.08	5467.41	36982.73	3698.27	33284.46	31.54	35	5939.28	6005.81	5939.28	27278.65	18.04
12	Poonch	1591.22	10246.4	5615.96	2659.02	20112.6	2011.26	18101.34	717.5	17.5	1939.25	2674.26	1939.25	15427.08	14.77
13	Pulwama	2581.86	15025.21	6548.9	3376.43	27532.4	2753.24	24779.16	1854.45	17.28	4867.06	6738.79	4867.06	18040.37	27.2
14	Rajouri	10492.44	14807.3	4278.95	7557.19	37135.88	3713.59	33422.29	668.5	17.5	3462.84	4148.85	3516.65	29219.64	12.41
15	Ramban	120.08	665.55	423.81	349.63	1559.07	155.9	1403.17	59.5	17.5	381.08	458.08	409.66	916.51	32.65
16	Reasi	2404.71	2596.28	980.67	1117.29	7098.95	709.9	6389.05	178.7	73.58	1147.31	1399.6	1195.27	4941.49	21.91
17	Samba	8363.41	8264.01	3299.96	3476.67	23404.05	2340.4	21063.65	1147.57	126.12	2221.36	3495.05	2241.26	17548.69	16.59
18	Shopian	1742.08	8140.4	4616.21	3575.33	18074.02	1807.4	16266.62	129.6	27	2267.06	2423.66	2267.06	13842.96	14.9
19	Srinagar Urban	2966.34	472.42	7524.12	631.48	11594.36	1159.44	10434.92	87.28	662.13	7412.15	8161.56	8049.81	1635.7	78.21
20	Udhampur	6104.51	5708.02	3060.67	2850.41	17723.61	1642.35	16081.26	872.5	120.31	2859.1	3851.91	2923.74	12164.71	23.95
	Total(Ham)	**117363.01**	**194323.13**	**117686.19**	**64399.85**	**493772.18**	**47445.69**	**446326.49**	**31549.52**	**5414.82**	**71059.55**	**108023.94**	**73000.8**	**336361.32**	**24.2**
	Total(Bcm)	**1.17**	**1.94**	**1.18**	**0.64**	**4.94**	**0.47**	**4.46**	**0.32**	**0.05**	**0.71**	**1.08**	**0.73**	**3.36**	**24.2**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
LADAKH															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Kargil	629.14	1071.66	1464.66	0	3165.46	316.57	2848.89	0	3.45	710.7	714.15	710.7	2134.74	25.07
2	Leh	683.3	4200.85	835.68	0	5719.83	571.96	5147.87	0	17.25	2231	2248.25	2231	2899.62	43.67
	Total(Ham)	**1312.44**	**5272.51**	**2300.34**	**0**	**8885.29**	**888.53**	**7996.76**	**0**	**20.7**	**2941.7**	**2962.4**	**2941.7**	**5034.36**	**37.05**
	Total(Bcm)	**0.01**	**0.05**	**0.02**	**0**	**0.09**	**0.01**	**0.08**	**0**	**0.0002**	**0.03**	**0.03**	**0.03**	**0.05**	**37.05**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
LAKSHADWEEP															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Lakshadweep	1104.21	1.19	276.05	0.00	1381.45	834.64	546.81	0.00	0.00	337.50	337.51	339.05	207.77	61.72
	Total(Ham)	**1104.21**	**1.19**	**276.05**	**0.00**	**1381.45**	**834.64**	**546.81**	**0.00**	**0.00**	**337.50**	**337.51**	**339.05**	**207.77**	**61.72**
	Total(Bcm)	**0.011**	**0.00001**	**0.003**	**0.000**	**0.014**	**0.008**	**0.005**	**0.000**	**0.000**	**0.003**	**0.003**	**0.003**	**0.002**	**61.72**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023															
PUDUCHERRY															
S. No.	Name of District	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for Domestic Use as on	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Puducherry	3804.66	7046.53	1429.10	3224.02	15504.31	1277.75	14226.56	6888.50	547.20	4184.44	11620.15	4484.28	2401.48	81.68
2	Karaikal	1267.60	2115.32	32.83	886.85	4302.60	430.27	3872.32	528.78	17.58	552.36	1098.72	194.68	2741.94	28.37
	Total(Ham)	**5072.26**	**9161.85**	**1461.93**	**4110.87**	**19806.91**	**1708.02**	**18098.88**	**7417.28**	**564.78**	**4736.81**	**12718.87**	**4678.96**	**5143.42**	**70.27**
	Total(Bcm)	**0.05**	**0.09**	**0.01**	**0.04**	**0.20**	**0.02**	**0.18**	**0.07**	**0.01**	**0.05**	**0.13**	**0.05**	**0.05**	**70.27**

Annexure - III(A)

State-Wise Categorization of Blocks/ Mandals/ Taluks in India (as in 2023)

CATEGORIZATION OF BLOCKS/ MANDALS/ TALUKAS IN INDIA (2023)

S.No.	State/Union Territories	Total No. of Assessed Units	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
	States		Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%
1	Andhra Pradesh	667	597	89.5	18	2.7	3	0.5	10	1.5	39	5.85
2	Arunachal Pradesh	42	42	100								
3	Assam	245	244	99.59	1	0.41						
4	Bihar	535	467	87.29	53	9.91	7	1.31	8	1.5		
5	Chhattisgarh	146	119	81.51	22	15.07	5	3.42				
6	Delhi	34	5	14.71	4	11.76	12	35.29	13	38.24		
7	Goa	12	12	100								
8	Gujarat	252	189	75	20	7.94	8	3.17	23	9.13	12	4.76
9	Haryana	143	35	24.48	9	6.29	11	7.69	88	61.54		
10	Himachal Pradesh	10	10	100								
11	Jharkhand	263	241	91.63	11	4.18	6	2.28	5	1.9		
12	Karnataka	234	146	62.39	32	13.68	12	5.13	44	18.8		
13	Kerala	152	119	78.29	30	19.74	3	1.97				
14	Madhya Pradesh	317	226	71.29	60	18.93	5	1.58	26	8.2		
15	Maharashtra	353	277	78.47	57	16.15	9	2.55	9	2.55	1	0.28
16	Manipur	9	9	100.00								
17	Meghalaya	39	39	100								
18	Mizoram	26	26	100								
19	Nagaland	52	52	100								
20	Odisha	314	299	95.22	9	2.87					6	1.91
21	Punjab	153	20	13.07	13	8.5	3	1.96	117	76.47		
22	Rajasthan	302	38	12.58	22	7.28	23	7.62	216	71.52	3	0.99
23	Sikkim	6	6	100								
24	Tamil Nadu	313	125	39.94	56	17.89	27	8.63	100	31.95	5	1.60
25	Telangana	612	530	86.60	61	9.97	10	1.63	11	1.80		
26	Tripura	59	59	100								
27	Uttar Pradesh	836	559	66.87	172	20.57	43	5.14	62	7.42		
28	Uttarakhand	18	14	77.78	4	22.22						
29	West Bengal	345	241	69.86	32	9.28	12	3.48			60	17.39
30	Andaman And Nicobar	9	9	100								
31	Chandigarh	1			1	100						
32	Dadra & Nagar Haveli	1							1	100		
	Daman & Diu	2							2	100		
33	Jammu And Kashmir	20	19	95	1	5						
34	Ladakh	18	12	66.67	6	33.33						
35	Lakshadweep	5	4	80	1	20						
36	Puducherry	8	3	37.50	3	37.50			1	12.50	1	12.50
	Grand Total	**6553**	**4793**	**73.14**	**698**	**10.65**	**199**	**3.04**	**736**	**11.23**	**127**	**1.94**

Note-

Blocks- Arunachal Pradesh, Assam,Bihar, Chhatisgarh, Haryana, Jharkhand, Kerala, Madhya Pradesh, Manipur, Meghalaya, Mizoram,Nagaland, Odisha, Punjab, Rajasthan, Tripura, Uttar Pradesh, Uttarakhand, West Bengal,Andaman & Nicobar Island, Ladakh,Lakshadweep

Taluks- Goa, Gujarat, Karnataka, Maharashtra,Tamil Nadu, Puducherry

Mandals- Andhra Pradesh, Telangana

District- Sikkim, Dadra & Nagar Haveli, Daman & Diu, Jammu & Kashmir

Valley- Himachal Pradesh

UT- Chandigarh

Tehsil- Delhi

Annexure - III(B)

District-Wise Categorization of Blocks/ Mandals/ Taluks in India (as in 2023)

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
ANDHRA PRADESH												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Sri Potti Sriramulu	37	37	100.00								
2	Nandyal	29	29	100.00								
3	Srikakulam	30	27	90.00	1	3.33	1	3.33	1	3.33		
4	Vizianagaram	27	27	100.00								
5	Sri Sathya Sai	32	24	75.00	3	9.38	1	3.13	4	12.50		
6	Alluri Sitharama Raju	22	22	100.00								
7	Konaseema	22	15	68.18							7	31.82
8	Eluru	28	22	78.57							6	21.43
9	West Godavari	19	7	36.84							12	63.16
10	Bapatla	25	24	96.00							1	4.00
11	Palnadu	28	26	92.86			1	3.57	1	3.57		
12	Kakinada	21	19	90.48							2	9.52
13	Y.S.R Kadapa	36	34	94.44	1	2.78			1	2.78		
14	Ananthapuramu	31	30	96.77	1	3.23						
15	Chittoor	31	24	77.42	7	22.58						
16	East Godavari	19	18	94.74	1	5.26						
17	Guntur	17	15	88.24							2	11.76
18	Krishna	25	16	64.00							9	36.00
19	Kurnool	25	25	100.00								
20	Prakasam	38	33	86.84	2	5.26			3	7.89		
21	Visakhapatnam	5	5	100.00								
22	Anakapalli	24	24	100.00								
23	Annamayya	30	28	93.33	2	6.67						
24	Ntr	17	17	100.00								
25	Parvathipuram Manyam	15	15	100.00								
26	Tirupati	34	34	100.00								
	Total	**667**	**597**	**89.51**	**18**	**2.70**	**3**	**0.45**	**10**	**1.50**	**39**	**5.85**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
ARUNACHAL PRADESH												
S.No	Name of District	Total No. of Assessed Units	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Changlang	5	5	100.00								
2	East Kameng	4	4	100.00								
3	East Siang	4	4	100.00								
4	Lohit	5	5	100.00								
5	Lower Dibang Valley	2	2	100.00								
6	Lower Subansiri	3	3	100.00								
7	Papum Pare	4	4	100.00								
8	Tirap	4	4	100.00								
9	Upper Subansiri	2	2	100.00								
10	West Kameng	5	5	100.00								
11	West Siang	4	4	100.00								
	Total	**42**	**42**	**100.00**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
Assam													
S.No	Name of District	Total No. of Assessed Units	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Dhemaji	5	5	100.00								
2	Bongaigaon	5	5	100.00								
3	Jorhat	8	8	100.00								
4	Kokrajhar	11	11	100.00								
5	Kamrup (M) Rural	3	3	100.00								
6	Darrang	7	7	100.00								
7	Hailakandi	5	5	100.00								
8	Kamrup (M) Urban	1			1	100.00						
9	Kamrup	14	14	100.00								
10	Karbi Anglong	11	11	100.00								
11	Nalbari	7	7	100.00								
12	Sonitpur	14	14	100.00								
13	Tinsukia	7	7	100.00								
14	Sibsagar	9	9	100.00								
15	Lakhimpur	9	9	100.00								
16	Dhubri	15	15	100.00								
17	Morigaon	7	7	100.00								
18	Nagaon	20	20	100.00								
19	Dima Hasao	5	5	100.00								
20	Chirang	5	5	100.00								
21	Karimganj	7	7	100.00								
22	Baksa	10	10	100.00								
23	Goalpara	8	8	100.00								
24	Udalguri	10	10	100.00								
25	Barpeta	12	12	100.00								
26	Cachar	15	15	100.00								
27	Dibrugarh	7	7	100.00								
28	Golaghat	8	8	100.00								
	Total	**245**	**244**	**99.59**	**1**	**0.41**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
BIHAR												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Begusarai	18	14	77.78	4	22.22						
2	Supaul	11	11	100.00								
3	Banka	11	11	100.00								
4	Nawada	14	9	64.29	5	35.71						
5	Aurangabad	11	11	100.00								
6	Bhagalpur	16	16	100.00								
7	Kaimur	11	10	90.91	1	9.09						
8	Saharsa	10	10	100.00								
9	Bhojpur	14	10	71.43	4	28.57						
10	Sitamarhi	17	17	100.00								
11	Siwan	19	19	100.00								
12	West Champaran	18	18	100.00								
13	Araria	9	9	100.00								
14	Arwal	5	5	100.00								
15	Darbhanga	18	18	100.00								
16	East Champaran	27	27	100.00								
17	Gaya	24	20	83.33	4	16.67						
18	Jamui	10	10	100.00								
19	Jehanabad	7	2	28.57	3	42.86			2	28.57		
20	Katihar	16	16	100.00								
21	Khagaria	7	7	100.00								
22	Kishanganj	7	7	100.00								
23	Lakhisarai	7	7	100.00								
24	Madhepura	13	13	100.00								
25	Madhubani	21	21	100.00								
26	Munger	9	9	100.00								
27	Muzaffarpur	16	7	43.75	7	43.75	1	6.25	1	6.25		
28	Nalanda	20	8	40.00	10	50.00	1	5.00	1	5.00		
29	Patna	24	16	66.67	6	25.00	1	4.17	1	4.17		
30	Purnea	14	14	100.00								
31	Rohtas	19	17	89.47	2	10.53						
32	Samastipur	20	13	65.00	5	25.00	1	5.00	1	5.00		
33	Saran	20	20	100.00								
34	Sheikhpura	6	5	83.33			1	16.67				
35	Sheohar	5	5	100.00								
36	Vaishali	16	10	62.50	2	12.50	2	12.50	2	12.50		
37	Buxar	11	11	100.00								
38	Gopalganj	14	14	100.00								
	Total	**535**	**467**	**87.29**	**53**	**9.91**	**7**	**1.31**	**8**	**1.50**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
CHHATISGARH													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%	
1	Balod	5	2	40.00	2	40.00	1	20.00					
2	Baloda Bazar	5	5	100.00									
3	Balrampur	6	6	100.00									
4	Bastar	7	7	100.00									
5	Bemetara	4			1	25.00	3	75.00					
6	Bijapur	4	4	100.00									
7	Bilaspur	4	2	50.00	2	50.00							
8	Dantewada	4	4	100.00									
9	Dhamtari	4	2	50.00	2	50.00							
10	Durg	3	1	33.33	2	66.67							
11	Gariaband	5	4	80.00	1	20.00							
12	Gourela-Pendra-Marwahi	3	3	100.00									
13	Janjgir-Champa	5	5	100.00									
14	Jashpur	8	8	100.00									
15	Kabirdham	4	3	75.00	1	25.00							
16	Kanker	7	6	85.71	1	14.29							
17	Khairagarh-Chhuikhadan_Gandai	2	1	50.00	1	50.00							
18	Kondagaon	5	5	100.00									
19	Korba	5	4	80.00	1	20.00							
20	Korea	2	2	100.00									
21	Mahasamund	5	4	80.00	1	20.00							
22	Manendragarh-Chirmiri_Bharatpur	3	3	100.00									
23	Mohla-Manpur_Ambagarhchowki	3	3	100.00									
24	Mungeli	3	3	100.00									
25	Narayanpur	2	2	100.00									
26	Raigarh	7	5	71.43	2	28.57							
27	Raipur	4	3	75.00			1	25.00					
28	Rajnandgaon	4	1	25.00	3	75.00							
29	Sakti	4	4	100.00									
30	Sarangarh-Bilairagh	3	2	66.67	1	33.33							
31	Sukma	3	3	100.00									
32	Surajpur	6	5	83.33	1	16.67							
33	Surguja	7	7	100.00									
	Total	146	119	81.51	22	15.07	5	3.42				0.00	

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
DELHI												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	North	3			1	33.33	1	33.33	1	33.33		
2	South East	3					3	100				
3	South West	3	1	33.33			1	33.33	1	33.33		
4	East	3					3	100				
5	Nazul Land	1	1	100								
6	South	3					1	33.33	2	66.67		
7	Central	3	1	33.33			1	33.33	1	33.33		
8	New Delhi	3							3	100		
9	North West	3	2	66.67	1	33.33						
10	West	3			1	33.33	1	33.33	1	33.33		
11	North East	3			1	33.33			2	66.67		
12	Shahdara	3					1	33.33	2	66.67		
	Total	**34**	**5**	**14.71**	**4**	**11.76**	**12**	**35.29**	**13**	**38.24**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
GOA													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Goa North	5	5	100								
2	South Goa	7	7	100								
	Total	12	12	100								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
GUJARAT												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Ahmedabad	10	4	40	1	10	2	20	1	10	2	20
2	Amreli	11	10	90.91	1	9.09						
3	Anand	8	8	100								
4	Arvalli	6	6	100								
5	Banaskantha	14	2	14.29	1	7.14			8	57.14	3	21.43
6	Bharuch	9	9	100								
7	Bhavnagar	10	10	100								
8	Botad	4	4	100								
9	Chhota Udepur	6	6	100								
10	Dahod	9	9	100								
11	Dang	3	3	100								
12	Devbhumi Dwarka	4	4	100								
13	Gandhinagar	4			2	50			2	50		
14	Gir Somnath	6	6	100								
15	Jamnagar	6	6	100								
16	Junagadh	9	9	100								
17	Kachchh	10	6	60			1	10	2	20	1	10
18	Kheda	10	10	100								
19	Mahesana	10			3	30	1	10	6	60		
20	Mahisagar	6	6	100								
21	Morbi	5	4	80							1	20
22	Narmada	5	4	80	1	20						
23	Navsari	6	6	100								
24	Panchmahal	7	7	100								
25	Patan	9			1	11.11	1	11.11	2	22.22	5	55.56
26	Porbandar	3	3	100								
27	Rajkot	12	7	58.33	4	33.33	1	8.33				
28	Sabarkantha	8	4	50	3	37.5			1	12.5		
29	Surat	10	9	90					1	10		
30	Surendranagar	10	9	90	1	10						
31	Tapi	7	7	100								
32	Vadodara	9	5	55.56	2	22.22	2	22.22				
33	Valsad	6	6	100								
	Total	**252**	**189**	**75**	**20**	**7.94**	**8**	**3.17**	**23**	**9.13**	**12**	**4.76**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
HARYANA												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Rohtak	5	5	100.00								
2	Karnal	8					1	12.50	7	87.50		
3	Kaithal	7							7	100.00		
4	Jind	8	2	25.00	1	12.50			5	62.50		
5	Kurukshetra	7							7	100.00		
6	Bhiwani	7	3	42.86					4	57.14		
7	Ambala	6			2	33.33	1	16.67	3	50.00		
8	Fatehabad	7					2	28.57	5	71.43		
9	Gurgaon	5							5	100.00		
10	Charkhi Dadri	4	2	50.00					2	50.00		
11	Faridabad	4							4	100.00		
12	Hisar	9	6	66.67	1	11.11	1	11.11	1	11.11		
13	Jhajjar	7	7	100.00								
14	Mahendragarh	8					2	25.00	6	75.00		
15	Mewat	7	3	42.86	1	14.29	1	14.29	2	28.57		
16	Palwal	6	2	33.33	1	16.67	1	16.67	2	33.33		
17	Panchkula	3	2	66.67			1	33.33				
18	Panipat	6							6	100.00		
19	Rewari	7					1	14.29	6	85.71		
20	Sirsa	7			1	14.29			6	85.71		
21	Sonipat	8	3	37.50					5	62.50		
22	Yamuna Nagar	7			2	28.57			5	71.43		
	Total	**143**	**35**	**24.48**	**9**	**6.29**	**11**	**7.69**	**88**	**61.54**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
HIMACHAL PRADESH													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Kangra	2	2	100								
2	Mandi	2	2	100								
3	Sirmaur	2	2	100								
4	Solan	1	1	100								
5	Una	3	3	100								
	Total	**10**	**10**	**100**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
JHARKHAND												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Godda	9	9	100								
2	Giridih	13	12	92.31	1	7.69						
3	Simdega	10	10	100								
4	Garhwa	19	18	94.74	1	5.26						
5	Pakur	6	6	100								
6	Ramgarh	6	4	66.67			1	16.67	1	16.67		
7	Sahebganj	9	9	100								
8	Dumka	10	10	100								
9	East Singhbhum	12	10	83.33					2	16.67		
10	Bokaro	9	8	88.89					1	11.11		
11	Chatra	12	12	100								
12	Deoghar	10	7	70	3	30						
13	Dhanbad	9	4	44.44	2	22.22	2	22.22	1	11.11		
14	Gumla	12	12	100								
15	Hazaribagh	16	15	93.75	1	6.25						
16	Jamtara	6	6	100								
17	Khunti	6	6	100								
18	Koderma	6	4	66.67	1	16.67	1	16.67				
19	Latehar	9	9	100								
20	Lohardaga	7	7	100								
21	Palamau	21	21	100								
22	Ranchi	19	15	78.95	2	10.53	2	10.53				
23	Saraikela Kharsawan	9	9	100								
24	West Singhbhum	18	18	100								
	Total	**263**	**241**	**91.63**	**11**	**4.18**	**6**	**2.28**	**5**	**1.9**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
KARNATAKA												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Bagalkot	9	2	22.22	5	55.56	1	11.11	1	11.11		
2	Ballari	5	5	100.00								
3	Belagavi	15	7	46.67	5	33.33	2	13.33	1	6.67		
4	Bengaluru (Rural)	4							4	100.00		
5	Bengaluru (Urban)	6							6	100.00		
6	Bidar	8	6	75.00	2	25.00						
7	Chamarajanagara	5			3	60.00	1	20.00	1	20.00		
8	Chikkaballapura	6							6	100.00		
9	Chikkamagaluru	9	7	77.78					2	22.22		
10	Chitradurga	6	1	16.67					5	83.33		
11	Dakshina Kannada	7	7	100.00								
12	Davanagere	6	3	50.00			1	16.67	2	33.33		
13	Dharwad	8	8	100.00								
14	Gadag	7	3	42.86	2	28.57	1	14.29	1	14.29		
15	Hassan	8	6	75.00			1	12.50	1	12.50		
16	Haveri	8	5	62.50	3	37.50						
17	Kalburgi	11	10	90.91	1	9.09						
18	Kodagu	5	5	100.00								
19	Kolara	6							6	100.00		
20	Koppal	7	4	57.14	2	28.57	1	14.29				
21	Mandya	7	6	85.71	1	14.29						
22	Mysuru	8	8	100.00								
23	Raichur	7	6	85.71	1	14.29						
24	Ramanagara	5			2	40.00	2	40.00	1	20.00		
25	Shivamogga	7	7	100.00								
26	Tumakuru	10	3	30.00	1	10.00	1	10.00	5	50.00		
27	Udupi	7	7	100.00						-		
28	Uttara Kannada	12	12	100.00						-		
29	Vijayanagara	6	2	33.33	1	16.67	1	16.67	2	33.33		
30	Vijayapura	13	12	92.31	1	7.69						
31	Yadgir	6	4	66.67	2	33.33						
	Total	**234**	**146**	**62.39**	**32**	**13.68**	**12**	**5.13**	**44**	**18.80**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
KERALA													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Kottayam	11	11	100								
2	Idukki	8	6	75	2	25						
3	Wayanad	4	4	100								
4	Ernakulam	14	14	100								
5	Thiruvananthapuram	11	5	45.45	6	54.55						
6	Thrissur	16	13	81.25	3	18.75						
7	Pathanamthitta	8	8	100								
8	Kannur	11	8	72.73	3	27.27						
9	Malappuram	15	7	46.67	8	53.33						
10	Kozhikkode	12	9	75	3	25						
11	Kollam	11	9	81.82	2	18.18						
12	Kasargod	6	4	66.67	1	16.67	1	16.67				
13	Alappuzha	12	12	100								
14	Palakkad	13	9	69.23	2	15.38	2	15.38				
	Total	**152**	**119**	**78.29**	**30**	**19.74**	**3**	**1.97**				

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
MADHYA PRADESH													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Agar Malwa	4	1	25	1	25			2	50		
2	Alirajpur	6	6	100								
3	Anuppur	4	3	75	1	25						
4	Ashoknagar	4	2	50	2	50						
5	Balaghat	10	10	100								
6	Barwani	7	5	71.43	1	14.29			1	14.29		
7	Betul	10	8	80	2	20						
8	Bhind	6	6	100								
9	Bhopal	3			3	100						
10	Burhanpur	2	1	50	1	50						
11	Chhatarpur	8	4	50	4	50						
12	Chhindwara	11	8	72.73	2	18.18	1	9.09				
13	Damoh	7	6	85.71	1	14.29						
14	Datia	3	3	100								
15	Dewas	6	3	50	1	16.67			2	33.33		
16	Dhar	13	9	69.23			1	7.69	3	23.08		
17	Dindori	7	7	100								
18	Guna	5	5	100								
19	Gwalior	5	4	80	1	20						
20	Harda	3	3	100								
21	Hoshangabad	7	6	85.71	1	14.29						
22	Indore	5			1	20	1	20	3	60		
23	Jabalpur	8	7	87.5	1	12.5						
24	Jhabua	6	5	83.33	1	16.67						
25	Katni	6	6	100								
26	Khandwa	7	6	85.71	1	14.29						
27	Khargone	9	8	88.89	1	11.11						
28	Mandla	9	9	100								
29	Mandsaur	5			3	60			2	40		
30	Morena	7	7	100								
31	Narsinghpur	6	5	83.33	1	16.67						
32	Neemuch	3			1	33.33			2	66.67		
33	Niwari	2	1	50	1	50						
34	Panna	5	5	100								
35	Raisen	7	6	85.71	1	14.29						
36	Rajgarh	6			4	66.67	1	16.67	1	16.67		
37	Ratlam	6			2	33.33			4	66.67		
38	Rewa	9	8	88.89	1	11.11						
39	Sagar	11	11	100								
40	Satna	8	4	50	4	50						
41	Sehore	5	4	80			1	20				
42	Seoni	8	8	100								
43	Shahdol	5	5	100								
44	Shajapur	4			1	25			3	75		
45	Sheopur	3	2	66.67	1	33.33						
46	Shivpuri	8	3	37.5	5	62.5						
47	Sidhi	5	5	100								
48	Singrauli	3	3	100								
49	Tikamgarh	4			4	100						
50	Ujjain	6			3	50			3	50		
51	Umaria	3	3	100								
52	Vidisha	7	5	71.43	2	28.57						
	Total	**317**	**226**	**71.29**	**60**	**18.93**	**5**	**1.58**	**26**	**8.2**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
MAHARASHTRA												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Buldhana	13	4	30.77	7	53.85			2	15.38		
2	Gondia	8	8	100								
3	Osmanabad	8	6	75	2	25						
4	Satara	11	9	81.82	2	18.18						
5	Jalgaon	15	3	20	10	66.67			2	13.33		
6	Beed	11	11	100								
7	Nashik	15	9	60	3	20	3	20				
8	Nandurbar	6	6	100								
9	Sangli	10	9	90	1	10						
10	Parbhani	9	9	100								
11	Aurangabad	9	2	22.22	7	77.78						
12	Jalna	8	8	100								
13	Latur	10	9	90	1	10						
14	Nagpur	13	12	92.31	1	7.69						
15	Ahmednagar	14	4	28.57	5	35.71	4	28.57	1	7.14		
16	Akola	7	6	85.71	1	14.29						
17	Amravati	14	6	42.86	3	21.43	1	7.14	3	21.43	1	7.14
18	Bhandara	7	7	100								
19	Chandrapur	15	15	100								
20	Dhule	4	4	100								
21	Gadchiroli	12	12	100								
22	Hingoli	5	5	100								
23	Nanded	16	16	100								
24	Palghar	8	8	100								
25	Pune	13	5	38.46	7	53.85	1	7.69				
26	Raigad	15	15	100								
27	Ratnagiri	9	9	100								
28	Sindhudurg	8	8	100								
29	Solapur	11	3	27.27	7	63.64			1	9.09		
30	Thane	7	7	100								
31	Wardha	8	8	100								
32	Washim	6	6	100								
33	Yawatmal	16	16	100								
34	Kolhapur	12	12	100								
	Total	**353**	**277**	**78.47**	**57**	**16.15**	**9**	**2.55**	**9**	**2.55**	**1**	**0.28**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
MANIPUR												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Bishnupur	2	2	100.00								
2	Churachandpur	1	1	100.00								
3	Imphal East	2	2	100.00								
4	Imphal West	2	2	100.00								
5	Thoubal	2	2	100.00								
	Total	**9**	**9**	**100.00**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
MEGHALAYA													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	South West Khasi Hills	2	2	100								
2	South West Garo Hills	2	2	100								
3	West Garo Hills	6	6	100								
4	East Garo Hills	3	3	100								
5	East Jaintia Hills	2	2	100								
6	West Khasi Hills	4	4	100								
7	Ri Bhoi	3	3	100								
8	South Garo Hills	4	4	100								
9	West Jaintia Hills	3	3	100								
10	East Khasi Hills	8	8	100								
11	North Garo Hills	2	2	100								
	Total	39	39	100								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
MIZORAM													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Champhai	4	4	100								
2	Aizawl	5	5	100								
3	Serchhip	2	2	100								
4	Lunglei	4	4	100								
5	Saiha	2	2	100								
6	Kolasib	2	2	100								
7	Lawngtlai	4	4	100								
8	Mamit	3	3	100								
	Total	**26**	**26**	**100**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
NAGALAND												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Kiphire	3	3	100								
2	Zunheboto	6	6	100								
3	Wokha	5	5	100								
4	Kohima	4	4	100								
5	Longleng	2	2	100								
6	Mon	6	6	100								
7	Peren	3	3	100								
8	Phek	5	5	100								
9	Dimapur	4	4	100								
10	Tuensang	8	8	100								
11	Mokokchung	6	6	100								
	Total	52	52	100								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
ODISHA													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%	
1	Angul	8	7	87.5	1	12.5							
2	Balasore	12	11	91.67	1	8.33							
3	Bargarh	12	12	100									
4	Bhadrak	7	6	85.71							1	14.29	
5	Bolangir	14	14	100									
6	Boudh	3	3	100									
7	Cuttack	14	14	100									
8	Deogarh	3	3	100									
9	Dhenkanal	8	8	100									
10	Gajapati	7	7	100									
11	Ganjam	22	22	100									
12	Jagatsinghpur	8	7	87.5							1	12.5	
13	Jajpur	10	9	90	1	10							
14	Jharsuguda	5	4	80	1	20							
15	Kalahandi	13	13	100									
16	Kandhamal	12	12	100									
17	Kendrapara	9	5	55.56							4	44.44	
18	Keonjhar	13	13	100									
19	Khurda	10	7	70	3	30							
20	Koraput	14	14	100									
21	Malkangiri	7	7	100									
22	Mayurbhanj	26	26	100									
23	Nabarangapur	10	10	100									
24	Nayagarh	8	7	87.5	1	12.5							
25	Nuapada	5	4	80	1	20							
26	Puri	11	11	100									
27	Rayagada	11	11	100									
28	Sambalpur	9	9	100									
29	Subarnapur	6	6	100									
30	Sundargarh	17	17	100									
	Total	**314**	**299**	**95.22**	**9**	**2.87**					**6**	**1.91**	

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
PUNJAB												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Fazilka	5	3	60	1	20			1	20		
2	Pathankot	6	4	66.67	2	33.33						
3	Sas Nagar	3			1	33.33	1	33.33	1	33.33		
4	Muktsar	4	4	100								
5	Kapurthala	5							5	100		
6	Hoshiarpur	10	1	10	3	30			6	60		
7	Amritsar	10							10	100		
8	Barnala	3							3	100		
9	Sangrur	8							8	100		
10	Malerkotla	2							2	100		
11	Jalandhar	12							12	100		
12	Mansa	5	2	40	1	20			2	40		
13	Bathinda	9	2	22.22	1	11.11	1	11.11	5	55.56		
14	Fatehgarh Sahib	5							5	100		
15	Faridkot	3							3	100		
16	Rupnagar	5	2	40	1	20			2	40		
17	Moga	5							5	100		
18	Tarn Taran	8							8	100		
19	Patiala	9							9	100		
20	Sbs Nagar	5	1	20			1	20	3	60		
21	Ludhiana	14							14	100		
22	Firozpur	6			2	33.33			4	66.67		
23	Gurdaspur	11	1	9.09	1	9.09			9	81.82		
	Total	**153**	**20**	**13.07**	**13**	**8.5**	**3**	**1.96**	**117**	**76.47**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
RAJASTHAN													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Dhaulpur	5							5	100		
2	Pratapgarh	5	1	20			1	20	3	60		
3	Alwar	14							14	100		
4	Dausa	6							6	100		
5	Bikaner	8	3	37.5	1	12.5			3	37.5	1	12.50
6	Karauli	6			1	16.67			5	83.33		
7	Chittaurgarh	11							11	100		
8	Ajmer	10							10	100		
9	Bharatpur	10							10	100		
10	Jalor	8					1	12.5	7	87.5		
11	Baran	7			1	14.29	2	28.57	4	57.14		
12	Udaipur	18			1	5.56	11	61.11	6	33.33		
13	Jaisalmer	4							4	100		
14	Sirohi	5			1	20	1	20	3	60		
15	Tonk	6	1	16.67	1	16.67	1	16.67	3	50		
16	Rajsamand	7					2	28.57	5	71.43		
17	Jaipur	16							16	100		
18	Ganganagar	9	9	100								
19	Dungarpur	10	8	80	2	20						
20	Bhilwara	12							12	100		
21	Sawai Madhopur	6							6	100		
22	Jhunjhunu	8							8	100		
23	Bundi	5	1	20	1	20			3	60		
24	Jodhpur	17			1	5.88	1	5.88	15	88.24		
25	Barmer	17	1	5.88	2	11.76			14	82.35		
26	Jhalawar	8	1	12.5			2	25	5	62.5		
27	Churu	7	1	14.29					5	71.43	1	14.29
28	Hanumangarh	7	5	71.43	1	14.29					1	14.29
29	Banswara	11	6	54.55	5	45.45						
30	Sikar	9			1	11.11			8	88.89		
31	Pali	10	1	10	1	10			8	80		
32	Kota	6			2	33.33			4	66.67		
33	Nagaur	14					1	7.14	13	92.86		
	Total	**302**	**38**	**12.58**	**22**	**7.28**	**23**	**7.62**	**216**	**71.52**	**3**	**0.99**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
SIKKIM												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Mangan	1	1	100								
2	Soreng	1	1	100								
3	Namchi	1	1	100								
4	Pakyong	1	1	100								
5	Gangtok	1	1	100								
6	Gyalshing	1	1	100								
	Total	**6**	**6**	**100**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
TAMIL NADU													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Ariyalur	4	3	75.00	1	25.00	0	0.00	0	0.00	0	0.00
2	Chengalpattu	8	5	62.50	3	37.50	0	0.00	0	0.00	0	0.00
3	Chennai	16	2	12.50	1	6.25	0	0.00	13	81.25	0	0.00
4	Coimbatore	11	1	9.09	1	9.09	2	18.18	7	63.64	0	0.00
5	Cuddalore	10	5	50.00	0	0.00	2	20.00	3	30.00	0	0.00
6	Dharmapuri	7	1	14.29	1	14.29	1	14.29	4	57.14	0	0.00
7	Dindigul	10	2	20.00	0	0.00	1	10.00	7	70.00	0	0.00
8	Erode	10	2	20.00	4	40.00	1	10.00	3	30.00	0	0.00
9	Kallakurichchi	6	3	50.00	1	16.67	2	33.33	0	0.00	0	0.00
10	Kancheepuram	5	4	80.00	1	20.00	0	0.00	0	0.00	0	0.00
11	Kanniyakumari	6	6	100.00	0	0.00	0	0.00	0	0.00	0	0.00
12	Karur	7	0	0.00	1	14.29	2	28.57	4	57.14	0	0.00
13	Krishnagiri	8	3	37.50	1	12.50	2	25.00	2	25.00	0	0.00
14	Madurai	11	7	63.64	3	27.27	1	9.09	0	0.00	0	0.00
15	Mayiladuthurai	4	0	0.00	0	0.00	0	0.00	4	100.00	0	0.00
16	Nagapattinam	4	0	0.00	0	0.00	0	0.00	0	0.00	4	100.00
17	Namakkal	8	1	12.50	1	12.50	0	0.00	6	75.00	0	0.00
18	Perambalur	4	1	25.00	0	0.00	0	0.00	3	75.00	0	0.00
19	Pudukkottai	12	9	75.00	3	25.00	0	0.00	0	0.00	0	0.00
20	Ramanathapuram	9	9	100.00	0	0.00	0	0.00	0	0.00	0	0.00
21	Ranipet	6	0	0.00	4	66.67	1	16.67	1	16.67	0	0.00
22	Salem	14	1	7.14	0	0.00	1	7.14	12	85.71	0	0.00
23	Sivagangai	9	9	100.00	0	0.00	0	0.00	0	0.00	0	0.00
24	Tenkasi	8	3	37.50	3	37.50	0	0.00	2	25.00	0	0.00
25	Thanjavur	9	0	0.00	1	11.11	4	44.44	4	44.44	0	0.00
26	The Nilgiris	6	6	100.00	0	0.00	0	0.00	0	0.00	0	0.00
27	Theni	5	2	40.00	2	40.00	1	20.00	0	0.00	0	0.00
28	Thiruvarur	8	4	50.00	0	0.00	0	0.00	3	37.50	1	12.50
29	Thoothukudi	10	9	90.00	1	10.00	0	0.00	0	0.00	0	0.00
30	Tiruchirappalli	11	6	54.55	1	9.09	0	0.00	4	36.36	0	0.00
31	Tirunelveli	8	6	75.00	2	25.00	0	0.00	0	0.00	0	0.00
32	Tirupathur	4	0	0.00	0	0.00	0	0.00	4	100.00	0	0.00
33	Tiruppur	9	0	0.00	4	44.44	2	22.22	3	33.33	0	0.00
34	Tiruvallur	9	7	77.78	2	22.22	0	0.00	0	0.00	0	0.00
35	Tiruvannamalai	12	2	16.67	6	50.00	2	16.67	2	16.67	0	0.00
36	Vellore	6	0	0.00	1	16.67	0	0.00	5	83.33	0	0.00
37	Villupuram	9	2	22.22	2	22.22	1	11.11	4	44.44	0	0.00
38	Virudhunagar	**10**	**4**	**40.00**	**5**	**50.00**	**1**	**10.00**	**0**	**0.00**	**0**	**0.00**
	Total	**313**	**125**	**39.94**	**56**	**17.89**	**27**	**8.63**	**100**	**31.95**	**5**	**1.60**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
TELANGANA												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Jagtial	20	18	90.00	2	10.00						
2	Karimnagar	16	15	93.75	1	6.25						
3	Kamareddy	24	20	83.33	4	16.67						
4	Medak	21	18	85.71	3	14.29						
5	Nirmal	19	19	100.00								
6	Mahabubnagar	17	15	88.24	2	11.76						
7	Narayanpet	13	13	100.00								
8	Suryapet	23	23	100.00								
9	Adilabad	18	16	88.89			1	5.56	1	5.56		
10	Khammam	21	20	95.24	1	4.76						
11	Jayashankar Bhupalapally	11	11	100.00								
12	Nalgonda	32	25	78.13	7	21.88						
13	Wanaparthy	14	14	100.00								
14	Rangareddy	27	23	85.19	4	14.81						
15	Rajanna Siricilla	13	10	76.92	3	23.08						
16	Komarambheem Asifabad	15	15	100.00								
17	Mulug	9	9	100.00								
18	Hyderabad	16			4	25.00	6	37.50	6	37.50		
19	Peddapalle	14	14	100.00								
20	Bhadradri Kothagudem	23	20	86.96	3	13.04						
21	Jangaon	12	11	91.67	1	8.33						
22	Jogulamba Gadwal	12	11	91.67	1	8.33						
23	Mahabubabad	18	17	94.44	1	5.56						
24	Mancherial	18	18	100.00								
25	Medchal Malkajgiri	15	10	66.67	2	13.33			3	20.00		
26	Nagarkurnool	20	19	95.00	1	5.00						
27	Nizamabad	33	26	78.79	6	18.18			1	3.03		
28	Sangareddy	28	23	82.14	4	14.29	1	3.57				
29	Siddipet	26	19	73.08	6	23.08	1	3.85				
30	Vikarabad	20	20	100.00								
31	Warangal	13	13	100.00								
32	Hanumakonda	14	9	64.29	4	28.57	1	7.14				
33	Yadadri Bhuvanagiri	17	16	94.12	1	5.88						
	Total	**612**	**530**	86.60	**61**	9.97	**10**	**1.63**	**11**	1.80		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
TRIPURA													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Dhalai	8	8	100								
2	North Tripura	8	8	100								
3	Khowai	6	6	100								
4	Gomati	8	8	100								
5	West Tripura	10	10	100								
6	Unakoti	4	4	100								
7	South Tripura	8	8	100								
8	Sepahijala	7	7	100								
	Total	**59**	**59**	**100**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
UTTAR PRADESH												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Lalitpur	6			6	100.00						
2	Saharanpur	11	1	9.09	6	54.55			4	36.36		
3	Banda	8	4	50.00	4	50.00						
4	Mathura	10	7	70.00			2	20.00	1	10.00		
5	Shamli	5			1	20.00	2	40.00	2	40.00		
6	Chandauli	9	9	100.00								
7	Mirzapur	12	7	58.33	3	25.00	1	8.33	1	8.33		
8	Unnao	16	16	100.00								
9	Bagpat	6			3	50.00			3	50.00		
10	Kanpur Dehat	10	3	30.00	7	70.00						
11	Chitrakoot	5	1	20.00	3	60.00	1	20.00				
12	Shahjahanpur	15	15	100.00								
13	Pilibhit	7	7	100.00								
14	Jaunpur	21	12	57.14	7	33.33	2	9.52				
15	Mahrajganj	12	12	100.00								
16	Ambedkar Nagar	9	8	88.89	1	11.11						
17	Maunath Bhanjan	9	9	100.00								
18	Kaushambi	8	2	25.00	4	50.00			2	25.00		
19	Raibareli	18	18	100.00								
20	Auraiya	7	7	100.00								
21	Etawah	8	8	100.00								
22	Mahoba	4			2	50.00			2	50.00		
23	Sitapur	19	19	100.00								
24	Hathras	7	1	14.29	2	28.57	1	14.29	3	42.86		
25	Budaun	15	5	33.33	6	40.00	2	13.33	2	13.33		
26	Bulandshahar	16	1	6.25	5	31.25	4	25.00	6	37.50		
27	Amethi	13	12	92.31	1	7.69						
28	Bareilly	16	11	68.75	4	25.00			1	6.25		
29	Gonda	16	16	100.00								
30	Jhansi	8	4	50.00	4	50.00						
31	Aligarh	13	5	38.46	6	46.15	1	7.69	1	7.69		
32	Bijnor	11	6	54.55	4	36.36	1	9.09				
33	G.B.Nagar	3			1	33.33	1	33.33	1	33.33		
34	Gorakhpur	20	20	100.00								
35	Kannauj	8	3	37.50	2	25.00	1	12.50	2	25.00		
36	Etah	8	3	37.50	5	62.50						
37	Varanasi	9	2	22.22	3	33.33	1	11.11	3	33.33		
38	Lucknow	9	8	88.89					1	11.11		
39	Firozabad	9			3	33.33	1	11.11	5	55.56		
40	Azamgarh	22	22	100.00								
41	Deoria	16	16	100.00								
42	Balrampur	9	9	100.00								
43	Basti	14	14	100.00								
44	Ayodhya	11	11	100.00								
45	Agra	16			5	31.25	1	6.25	10	62.50		
46	Hapur	4			1	25.00	2	50.00	1	25.00		
47	Pratapgarh	17	4	23.53	9	52.94	4	23.53				
48	Bahraich	14	14	100.00								
49	Mainpuri	9	6	66.67	2	22.22			1	11.11		
50	Kushi Nagar	14	14	100.00								
51	Meerut	13	4	30.77	6	46.15	2	15.38	1	7.69		
52	Ghaziabad	5			1	20.00			4	80.00		
53	Fatehpur	13	7	53.85	5	38.46			1	7.69		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
UTTAR PRADESH													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%
54	Kasganj	7	4	57.14	3	42.86						
55	Moradabad	9	1	11.11	6	66.67	1	11.11	1	11.11		
56	Barabanki	15	15	100.00								
57	Sambhal	8	1	12.50	3	37.50	4	50.00				
58	Sant Kabir Nagar	9	9	100.00								
59	Lakhimpur Kheri	15	15	100.00								
60	Sant Ravidas Nagar	6			6	100.00						
61	Shrawasti	5	5	100.00								
62	Amroha	6			3	50.00	2	33.33	1	16.67		
63	Kanpur Nagar	11	3	27.27	6	54.55	2	18.18				
64	Siddharth Nagar	14	14	100.00								
65	Ghazipur	16	15	93.75	1	6.25						
66	Sonbhadra	10	9	90.00	1	10.00						
67	Hamirpur	7	5	71.43	2	28.57						
68	Ballia	17	17	100.00								
69	Farrukhabad	7	3	42.86	4	57.14						
70	Hardoi	19	19	100.00								
71	Jalaun	9	9	100.00								
72	Muzaffarnagar	9	4	44.44	2	22.22	2	22.22	1	11.11		
73	Prayagraj	24	13	54.17	8	33.33	2	8.33	1	4.17		
74	Rampur	6	1	16.67	5	83.33						
75	Sultanpur	14	14	100.00								
	Total	**836**	**559**	**66.87**	**172**	**20.57**	**43**	**5.14**	**62**	**7.42**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
UTTARAKHAND													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%	
1	Dehradun	3	3	100									
2	Haridwar	6	4	66.67	2	33.33							
3	Nainital	2	1	50	1	50							
4	Udhamsingh Nagar	7	6	85.71	1	14.29							
	Total	**18**	**14**	**77.78**	**4**	**22.22**							

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
WEST BENGAL													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Purba Barddhaman	23	19	82.61	4	17.39						
2	Murshidabad	26	20	76.92	5	19.23	1	3.85				
3	Jhargram	8	8	100								
4	North 24 Parganas	22	9	40.91	5	22.73	3	13.64			5	22.73
5	Koch Bihar	12	12	100								
6	Malda	15	14	93.33	1	6.67						
7	Paschim Barddhaman	8	7	87.5	1	12.5						
8	Kalimpong	3	3	100								
9	Alipurduar	6	6	100								
10	Uttar Dinajpur	9	9	100								
11	South 24 Parganas	29									29	100
12	Darjiling	9	9	100								
13	Hugli	18	15	83.33	3	16.67						
14	Puruliya	20	20	100								
15	Kolkatta	1									1	100
16	Haora	14	5	35.71							9	64.29
17	Bankura	22	22	100								
18	Jalpaiguri	9	9	100								
19	Dakshin Dinajpur	8	6	75	2	25						
20	Nadia	18	2	11.11	8	44.44	8	44.44				
21	Birbhum	19	19	100								
22	Purba Medinipur	25	9	36							16	64
23	Paschim Medinipur	21	18	85.71	3	14.29						
	Total	**345**	**241**	**69.86**	**32**	**9.28**	**12**	**3.48**			**60**	**17.39**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
ANDAMAN & NICOBAR ISLANDS													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%	
1	N & M Andaman	3	3	100.00									
2	Nicobar	3	3	100.00									
3	South Andaman	3	3	100.00									
	Total	**9**	**9**	**100.00**									

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
CHANDIGARH													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Chandigarh	1			1	100.00						
	Total	**1**			**1**	**100.00**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
DADRA & NAGAR HAVELI												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Dadra Nagar Haveli	1							1	100		
	Total	**1**							**1**	**100**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
DAMAN & DIU												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Daman	1							1	100		
2	Diu	1							1	100		
3	**Total**	**2**							**2**	**100**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
JAMMU & KASHMIR													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%	
1	Bandipora	1	1	100.00									
2	Ganderbal	1	1	100.00									
3	Doda	1	1	100.00									
4	Anantnag	1	1	100.00									
5	Ramban	1	1	100.00									
6	Srinagar Urban	1			1	100.00							
7	Budgam	1	1	100.00									
8	Jammu	1	1	100.00									
9	Pulwama	1	1	100.00									
10	Reasi	1	1	100.00									
11	Samba	1	1	100.00									
12	Kathua	1	1	100.00									
13	Kishtwar	1	1	100.00									
14	Kulgam	1	1	100.00									
15	Kupwara	1	1	100.00									
16	Poonch	1	1	100.00									
17	Mirpur												
18	Rajouri	1	1	100.00									
19	Shopian	1	1	100.00									
20	Baramulla	1	1	100.00									
	Total	**20**	**19**	**95.00**	**1**	**5.00**							

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
LADAKH													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Leh	9	3	33.33	6	66.67						
2	Kargil	9	9	100.00								
	Total	**18**	**12**	**66.67**	**6**	**33.33**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
LAKSHADWEEP													
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline		
			No.	%	No.	%	No.	%	No.	%	No.	%	
1	Lakshadweep	5	4	80.00	1	20.00							
	Total	5	4	80.00	1	20.00							

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
PUDUCHERRY												
S.No	Name of District	Total No. of Assessed Units	Safe		SemiCritical		Critical		OverExploited		Saline	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	Puducherry	6	1	16.67	3	50.00			1	16.67	1	16.66
2	Karaikal	2	2	100.00								
	Total	**8**	**3**	**37.50**	**3**	**37.50**			**1**	**12.50**	**1**	**12.50**

Annexure - III(C)

State-Wise Annual Extractable Ground Water Resource of Assessment Units under Different Category in India (as in 2023)

ANNUAL EXTRACTABLE RESOURCE OF ASSESSMENT UNITS UNDER DIFFERENT CATEGORIES IN INDIA(2023)

S.No.	State/Union Territories	Total Annual Extractable Resource of Assessed Units (in mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%
1	Andhra Pradesh	26445.91	25656.64	97.02	489.85	1.85	77.62	0.29	221.80	0.84
2	Arunachal Pradesh	4163.11	4163.11	100						
3	Assam	20931.53	20890.06	99.8	41.47	0.2				
4	Bihar	30718.81	28029.03	91.24	2168.92	7.06	237.4	0.77	283.46	0.92
5	Chhattisgarh	12183.72	9427.94	77.38	2288.8	18.79	466.98	3.83		
6	Delhi	344.49	73.44	21.32	46.94	13.63	102	29.61	122.11	35.45
7	Goa	317	317	100						
8	Gujarat	25405.18	20506.66	80.72	2050.16	8.07	743.01	2.92	2105.34	8.29
9	Haryana	8690.53	1917.52	22.06	697.24	8.02	587.66	6.76	5488.11	63.15
10	Himachal Pradesh	1014.53	1014.53	100						
11	Jharkhand	5730.94	5314.85	92.74	221.95	3.87	133.06	2.32	61.08	1.07
12	Karnataka	17080.79	11165.14	65.37	2245.55	13.15	948.56	5.55	2721.54	15.93
13	Kerala	5005.27	4107.22	82.06	761.3	15.21	136.74	2.73		
14	Madhya Pradesh	32853.75	22772.77	69.32	6119.62	18.63	537.1	1.63	3424.26	10.42
15	Maharashtra	30949.23	22810.91	73.70	6283.84	20.30	1037.96	3.35	816.52	2.64
16	Manipur	466.07	466.07	100.00						
17	Meghalaya	1507.61	1507.61	100						
18	Mizoram	199.56	199.56	100						
19	Nagaland	542.76	542.76	100						
20	Odisha	15933.74	15434.01	96.86	499.73	3.14				
21	Punjab	16978.36	2513.95	14.81	1360.17	8.01	309.67	1.82	12794.57	75.36
22	Rajasthan	11251.35	1222.65	10.87	935.81	8.32	857.87	7.62	8235.03	73.19
23	Sikkim	218.68	218.68	100						
24	Tamil Nadu	19505.70	8927.94	45.77	3776.07	19.36	2029.09	10.40	4772.59	24.47
25	Telangana	20920.92	19534.85	93.37	1268.76	6.06	97.23	0.46	20.08	0.10
26	Tripura	1094.05	1094.05	100						
27	Uttar Pradesh	65571.79	45401.02	69.24	12977.06	19.79	3276.41	5	3917.31	5.97
28	Uttarakhand	1846.93	1486.07	80.46	360.87	19.54				
29	West Bengal	23900.68	20075.68	84	2488.15	10.41	1336.84	5.59		
30	Andaman And Nicobar	556.59	556.59	100						
31	Chandigarh	48.41			48.41	100				
32	Dadra & Nagar Haveli	81.71							81.71	100
	Daman & Diu	33.47							33.47	100
33	Jammu And Kashmir	4463.26	4358.92	97.66	104.35	2.34				
34	Ladakh	79.97	56.41	70.54	23.56	29.46				
35	Lakshadweep	5.47	4.135	75.594	1.335	24				
36	Puducherry	180.99	40.89	22.59	116.03	64.11			24.06	13.30
	Grand Total	**407222.85**	**301808.67**	**74.11**	**47375.95**	**11.63**	**12915.20**	**3.17**	**45123.05**	**11.08**

Annexure - III(D)

District-Wise Annual Extractable Ground Water Resource of Assessment Units under Different Category in India (as in 2023)

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
ANDHRA PRADESH										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Alluri Sitharama Raju**	888.44	888.44	100.00						
2	**Anakapalli**	761.35	761.35	100.00						
3	**Ananthapuramu**	1171.45	1141.64	97.46	29.81	2.54				
4	**Annamayya**	845.99	813.65	96.18	32.34	3.82				
5	**Bapatla**	713.69	713.69	100.00						
6	**Chittoor**	885.07	683.95	77.28	201.12	22.72				
7	**East Godavari**	1065.70	1012.98	95.05	52.72	4.95				
8	**Eluru**	1577.37	1577.37	100.00						
9	**Guntur**	550.78	550.78	100.00						
10	**Kakinada**	974.80	974.80	100.00						
11	**Konaseema**	1076.96	1076.96	100.00						
12	**Krishna**	1901.61	1901.61	100.00						
13	**Kurnool**	732.34	732.34	100.00						
14	**Nandyal**	1011.23	1011.23	100.00						
15	**Ntr**	691.63	691.63	100.00						
16	**Palnadu**	952.86	904.75	94.95			30.69	3.22	17.43	1.83
17	**Parvathipuram Manyam**	897.56	897.56	100.00						
18	**Prakasam**	861.41	790.22	91.73	47.61	5.68			23.58	2.81
19	**Sri Potti Sriramulu Nellore**	2457.00	2457.00	100.00						
20	**Sri Sathya Sai**	1121.29	890.74	79.44	69.57	6.20	21.78	1.94	139.20	12.41
21	**Srikakulam**	847.45	750.87	88.60	41.08	4.85	25.16	2.97	30.34	3.58
22	**Tirupati**	1518.91	1518.91	100.00						
23	**Visakhapatnam**	130.00	130.00	100.00						
24	**Vizianagaram**	1222.63	1222.63	100.00						
25	**West Godavari**	571.77	571.77	100.00						
26	**Y.S.R Kadapa**	1016.62	989.77	97.36	15.60	1.53			11.25	1.11
	Total	**26445.91**	**25656.64**	**97.02**	**489.85**	**1.85**	**77.62**	**0.29**	**221.80**	**0.84**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
ARUNACHAL PRADESH										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Changlang**	694.99	694.99	100						
2	**East Kameng**	141.97	141.97	100						
3	**East Siang**	764.74	764.74	100						
4	**Lohit**	1017.18	1017.18	100						
5	**Lower Dibang Valley**	769.31	769.31	100						
6	**Lower Subansiri**	44.21	44.21	100						
7	**Papum Pare**	187.61	187.61	100						
8	**Tirap**	72.41	72.41	100						
9	**Upper Subansiri**	127.87	127.87	100						
10	**West Kameng**	169.77	169.77	100						
11	**West Siang**	173.06	173.06	100						
	Total	**4163.11**	**4163.11**	**100**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
ASSAM											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Dhemaji	903.99	903.99	100						
2	Bongaigaon	445.34	445.34	100						
3	Jorhat	564.54	564.54	100						
4	Kokrajhar	1588.44	1588.44	100						
5	Darrang	504.04	504.04	100						
6	Kamrup (M) Rural	182.31	182.31	100						
7	Hailakandi	208.76	208.76	100						
8	Kamrup (M) Urban	41.47			41.47	100				
9	Kamrup	766.98	766.98	100						
10	Karbi Anglong	1063.42	1063.42	100						
11	Nalbari	313.05	313.05	100						
12	Sonitpur	1264.66	1264.66	100						
13	Tinsukia	1248.86	1248.86	100						
14	Sibsagar	911.2	911.2	100						
15	Lakhimpur	719.39	719.39	100						
16	Dhubri	983.32	983.32	100						
17	Morigaon	429.39	429.39	100						
18	Nagaon	1016.14	1016.14	100						
19	Dima Hasao	566.63	566.63	100						
20	Chirang	972.52	972.52	100						
21	Golaghat	969.96	969.96	100						
22	Goalpara	586.56	586.56	100						
23	Baksa	1404.81	1404.81	100						
24	Karimganj	326.23	326.23	100						
25	Dibrugarh	1247.76	1247.76	100						
26	Cachar	416.21	416.21	100						
27	Udalguri	509.6	509.6	100						
28	Barpeta	775.99	775.99	100						
	Total	**20931.53**	**20890.06**	**99.8**	**41.47**	**0.2**				

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
BIHAR										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Begusarai	493.83	412.62	83.55	81.21	16.45				
2	Supaul	1020.36	1020.36	100						
3	Banka	592.46	592.46	100						
4	Nawada	617.35	471.57	76.39	145.78	23.61				
5	Aurangabad	1228.21	1228.21	100						
6	Bhagalpur	693.29	693.29	100						
7	Kaimur	721.01	651.95	90.42	69.06	9.58				
8	Saharsa	699.35	699.35	100						
9	Bhojpur	802.77	648.03	80.72	154.74	19.28				
10	Sitamarhi	630.52	630.52	100						
11	Siwan	945.32	945.32	100						
12	West Champaran	1660.87	1660.87	100						
13	Araria	1371.8	1371.8	100						
14	Arwal	190.06	190.06	100						
15	Darbhanga	681.04	681.04	100						
16	East Champaran	1733.33	1733.33	100						
17	Gaya	1124.09	906.5	80.64	217.59	19.36				
18	Jamui	427.89	427.89	100						
19	Jehanabad	285.95	105.35	36.84	105.34	36.84			75.26	26.32
20	Katihar	1144.1	1144.1	100						
21	Khagaria	437.77	437.77	100						
22	Kishanganj	686.32	686.32	100						
23	Lakhisarai	376.86	376.86	100						
24	Madhepura	952.33	952.33	100						
25	Madhubani	1236.84	1236.84	100						
26	Munger	348.65	348.65	100						
27	Muzaffarpur	1068.97	574.43	53.74	391.27	36.6	63.32	5.92	39.94	3.74
28	Nalanda	558.86	219.84	39.34	292.63	52.36	24.15	4.32	22.25	3.98
29	Patna	978.75	688.76	70.37	245.27	25.06	20.11	2.05	24.6	2.51
30	Purnea	1569.29	1569.29	100						
31	Rohtas	1132.62	997.66	88.08	134.96	11.92				
32	Samastipur	797.31	476.02	59.7	267.46	33.55	30.77	3.86	23.06	2.89
33	Saran	968.76	968.76	100						
34	Sheikhpura	160.62	136.12	84.75			24.5	15.25		
35	Sheohar	164.39	164.39	100						
36	Vaishali	712.26	475.76	66.8	63.6	8.93	74.55	10.47	98.35	13.81
37	Buxar	586.51	586.51	100						
38	Gopalganj	918.13	918.13	100						
	Total	**30718.81**	**28029.03**	**91.24**	**2168.92**	**7.06**	**237.4**	**0.77**	**283.46**	**0.92**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
CHHATISGARH										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Balod	352.98	150.77	42.71	137.95	39.08	64.26	18.2		
2	Baloda Bazar	524.5	524.5	100						
3	Balrampur	448.53	448.53	100						
4	Bastar	239.89	239.89	100						
5	Bemetara	451.65			135.12	29.92	316.53	70.08		
6	Bijapur	467.45	467.45	100						
7	Bilaspur	432.43	155.9	36.05	276.53	63.95				
8	Dantewada	245.65	245.65	100						
9	Dhamtari	643.23	186.23	28.95	456.99	71.05				
10	Durg	407.52	145.49	35.7	262.03	64.3				
11	Gariaband	336.93	250.86	74.45	86.08	25.55				
12	Gourela-Pendra-Marwahi	133.19	133.19	100						
13	Janjgir-Champa	344.34	344.34	100						
14	Jashpur	303.71	303.71	100						
15	Kabirdham	466.46	367.8	78.85	98.67	21.15				
16	Kanker	637.93	564.25	88.45	73.68	11.55				
17	Khairagarh-Chhuikhadan_Gandai	200.21	92.88	46.39	107.34	53.61				
18	Kondagaon	325.15	325.15	100						
19	Korba	458.44	398.17	86.85	60.27	13.15				
20	Korea	163.29	163.29	100						
21	Mahasamund	654.88	558.01	85.21	96.86	14.79				
22	Manendragarh-Chirmiri_Bharatpur	471.31	471.31	100						
23	Mohla-Manpur_Ambagarhchowki	154.54	154.54	100						
24	Mungeli	170.88	170.88	100						
25	Narayanpur	237.62	237.62	100						
26	Raigarh	399.16	319.25	79.98	79.92	20.02				
27	Raipur	450.86	364.66	80.88			86.19	19.12		
28	Rajnandgaon	351.72	102.49	29.14	249.23	70.86				
29	Sakti	304.74	304.74	100						
30	Sarangarh-Bilairagh	234.46	163.26	69.63	71.2	30.37				
31	Sukma	413.07	413.07	100						
32	Surajpur	375.57	278.63	74.19	96.94	25.81				
33	Surguja	381.43	381.43	100						
	Total	**12183.72**	**9427.94**	**77.38**	**2288.81**	**18.79**	**466.98**	**3.83**	**0.00**	**0.00**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
DELHI										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	North	42.08			18.06	42.93	5.36	12.73	18.66	44.34
2	South East	23.63					23.63	100		
3	South West	69.44	24.94	35.92			22.8	32.83	21.7	31.25
4	East	14.72					14.72	100		
5	Nazul Land	4.59	4.59	100						
6	South	40.27					9.73	24.15	30.54	75.85
7	Central	22.06	14.21	64.4			6.35	28.8	1.5	6.8
8	New Delhi	26.22							26.22	100
9	North West	34.54	29.7	85.98	4.84	14.02				
10	West	36.48			16.79	46.04	14.46	39.64	5.22	14.32
11	North East	15.98			7.24	45.34			8.73	54.66
12	Shahdara	14.47					4.95	34.19	9.52	65.81
	Total	**344.49**	**73.44**	**21.32**	**46.94**	**13.63**	**102**	**29.61**	**122.11**	**35.45**

GOA											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Goa North**	132.12	132.12	100						
2	**South Goa**	184.88	184.88	100						
	Total	**317.00**	**317.00**	**100**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
GUJARAT											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Ahmedabad	424.29	167.69	39.52	94.55	22.28	34.92	8.23	127.13	29.96
2	Amreli	1485.32	1443.03	97.15	42.29	2.85				
3	Anand	1075	1075	100						
4	Arvalli	857.13	857.13	100						
5	Banaskantha	1167.26	203.94	17.47	153.33	13.14			809.98	69.39
6	Bharuch	628.82	628.82	100						
7	Bhavnagar	1063.8	1063.8	100						
8	Botad	444.4	444.4	100						
9	Chhota Udepur	547.91	547.91	100						
10	Dahod	311.24	311.24	100						
11	Dang	273.99	273.99	100						
12	Devbhumi Dwarka	453.98	453.98	100						
13	Gandhinagar	576.1			286.52	49.73			289.58	50.27
14	Gir Somnath	699.69	699.69	100						
15	Jamnagar	1407.04	1407.04	100						
16	Junagadh	1540.38	1540.38	100						
17	Kachchh	920.11	683.52	74.29			55.77	6.06	180.82	19.65
18	Kheda	748.61	748.61	100						
19	Mahesana	710.18			219.71	30.94	118	16.62	372.47	52.45
20	Mahisagar	285.98	285.98	100						
21	Morbi	688.71	688.71	100						
22	Narmada	378.38	203.12	53.68	175.25	46.32				
23	Navsari	756.92	756.92	100						
24	Panchmahal	526.52	526.52	100						
25	Patan	364.03			119.72	32.89	124.93	34.32	119.39	32.8
26	Porbandar	212.86	212.86	100						
27	Rajkot	1717.86	1127.55	65.64	430.41	25.06	159.9	9.31		
28	Sabarkantha	740.59	297.26	40.14	371.06	50.1			72.27	9.76
29	Surat	1323.36	1189.66	89.9					133.7	10.1
30	Surendranagar	775.47	728.15	93.9	47.32	6.1				
31	Tapi	636.62	636.62	100						
32	Vadodara	979.33	619.83	63.29	110	11.23	249.49	25.48		
33	Valsad	683.31	683.31	100						
	Total	**25405.18**	**20506.66**	**80.72**	**2050.16**	**8.07**	**743.01**	**2.92**	**2105.34**	**8.29**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
HARYANA										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Rohtak**	302.29	302.29	100						
2	**Karnal**	859.98					128.35	14.92	731.63	85.08
3	**Kaithal**	427.62							427.62	100
4	**Jind**	785.15	134.13	17.08	68.19	8.69			582.83	74.23
5	**Kurukshetra**	373.24							373.24	100
6	**Bhiwani**	419.25	214.82	51.24					204.43	48.76
7	**Ambala**	394.97			111.82	28.31	86.45	21.89	196.71	49.8
8	**Fatehabad**	647					107.75	16.65	539.25	83.35
9	**Gurgaon**	201.84							201.84	100
10	**Charkhi Dadri**	186.49	85.84	46.03					100.65	53.97
11	**Faridabad**	117.71							117.71	100
12	**Hisar**	553.86	325.87	58.84	99.06	17.89	60.1	10.85	68.82	12.43
13	**Jhajjar**	333.93	333.93	100						
14	**Mahendragarh**	200.45					23.85	11.9	176.6	88.1
15	**Mewat**	159.94	56.78	35.5	16.37	10.23	32.79	20.5	54	33.76
16	**Palwal**	350.62	152.1	43.38	75.81	21.62	58.11	16.57	64.59	18.42
17	**Panchkula**	133.04	96.37	72.43			36.68	27.57		
18	**Panipat**	301.52							301.52	100
19	**Rewari**	264.09					53.58	20.29	210.51	79.71
20	**Sirsa**	560.16			109.53	19.55			450.63	80.45
21	**Sonipat**	545.45	215.38	39.49					330.07	60.51
22	**Yamuna Nagar**	571.93			216.47	37.85			355.46	62.15
	Total	**8690.53**	**1917.52**	**22.06**	**697.24**	**8.02**	**587.66**	**6.76**	**5488.11**	**63.15**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
HIMACHAL PRADESH											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Kangra	497.78	497.78	100						
2	Mandi	78.11	78.11	100						
3	Sirmaur	90.68	90.68	100						
4	Solan	153.81	153.81	100						
5	Una	194.15	194.15	100						
	Total	1014.53	1014.53	100						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
JHARKHAND											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	
1	Godda	213.76	213.76	100							
2	Giridih	385.37	357.33	92.73	28.03	7.27					
3	Simdega	239.51	239.51	100							
4	Garhwa	277.49	250.18	90.16	27.31	9.84					
5	Pakur	239.54	239.54	100							
6	Ramgarh	102.91	92.14	89.54			6.93	6.73	3.83	3.72	
7	Sahebganj	277.94	277.94	100							
8	Dumka	253.05	253.05	100							
9	East Singhbhum	250.38	222.13	88.72					28.25	11.28	
10	Bokaro	207.65	192.92	92.91					14.73	7.09	
11	Chatra	253.46	253.46	100							
12	Deoghar	154.46	120.7	78.14	33.76	21.86					
13	Dhanbad	254.28	87.93	34.58	92.82	36.5	59.26	23.3	14.28	5.61	
14	Gumla	314.14	314.14	100							
15	Hazaribagh	316.39	306.74	96.95	9.65	3.05					
16	Jamtara	84.23	84.23	100							
17	Khunti	125.35	125.35	100							
18	Koderma	58.84	42.3	71.89	8.17	13.89	8.37	14.22			
19	Latehar	224.87	224.87	100							
20	Lohardaga	179.89	179.89	100							
21	Palamau	313.69	313.69	100							
22	Ranchi	370.39	289.69	78.21	22.2	5.99	58.51	15.8			
23	Saraikela Kharsawan	162.71	162.71	100							
24	West Singhbhum	470.66	470.66	100							
	Total	**5730.94**	**5314.85**	**92.74**	**221.95**	**3.87**	**133.06**	**2.32**	**61.08**	**1.07**	

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
KARNATAKA										
			Safe		Semi-Critical		Critical		Over-Exploited	
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Bagalkot**	648.69	117.4	18.1	344.6	53.12	72.73	11.21	113.96	17.57
2	**Ballari**	619.03	619.03	100						
3	**Belagavi**	1141.41	563.65	49.38	402.11	35.23	120.75	10.58	54.91	4.81
4	**Bengaluru (Rural)**	188.11							188.11	100
5	**Bengaluru (Urban)**	213.46							213.46	100
6	**Bidar**	338.83	247.65	73.09	91.17	26.91				
7	**Chamarajanagara**	362.41			160	44.15	120.76	33.32	81.65	22.53
8	**Chikkaballapura**	313.54							313.54	100
9	**Chikkamagaluru**	628.46	487.96	77.64					140.5	22.36
10	**Chitradurga**	418.29	28.99	6.93					389.3	93.07
11	**Dakshina Kannada**	659.97	659.97	100						
12	**Davanagere**	563.47	299.64	53.18			94.93	16.85	168.91	29.98
13	**Dharwad**	290.84	290.84	100						
14	**Gadag**	322.87	94.45	29.25	169.67	52.55	37.36	11.57	21.38	6.62
15	**Hassan**	713.68	486.55	68.17			140.41	19.67	86.72	12.15
16	**Haveri**	592.23	463.5	78.26	128.73	21.74				
17	**Kalburgi**	652.86	587.18	89.94	65.68	10.06				
18	**Kodagu**	222.1	222.1	100						
19	**Kolara**	409.34							409.34	100
20	**Koppal**	591.04	404.3	68.4	116.12	19.65	70.62	11.95		
21	**Mandya**	661.95	522.47	78.93	139.48	21.07				
22	**Mysuru**	563.83	563.83	100						
23	**Raichur**	698.17	590.07	84.52	108.1	15.48				
24	**Ramanagara**	407.35			193.29	47.45	151.38	37.16	62.67	15.39
25	**Shivamogga**	965.75	965.75	100						
26	**Tumakuru**	747.16	243.1	32.54	61.64	8.25	49.69	6.65	392.73	52.56
27	**Udupi**	471.38	471.38	100						
28	**Uttara Kannada**	839.02	839.02	100						
29	**Vijayanagara**	369.67	108.45	29.34	86.92	23.51	89.93	24.33	84.37	22.82
30	**Vijayapura**	953.97	915.29	95.95	38.68	4.05				
31	**Yadgir**	511.91	372.56	72.78	139.35	27.22				
	Total	**17080.79**	**11165.14**	**65.37**	**2245.55**	**13.15**	**948.56**	**5.55**	**2721.54**	**15.93**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
KERALA										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Kottayam**	370.31	370.31	100						
2	**Idukki**	188.57	144.9	76.84	43.67	23.16				
3	**Wayanad**	203.78	203.78	100						
4	**Ernakulam**	462.48	462.48	100						
5	**Thiruvananthapuram**	257.82	164.78	63.91	93.04	36.09				
6	**Thrissur**	558.81	462.24	82.72	96.56	17.28				
7	**Pathanamthitta**	208.7	208.7	100						
8	**Kannur**	398.53	338.41	84.91	60.12	15.09				
9	**Malappuram**	484.34	259.04	53.48	225.3	46.52				
10	**Kozhikkode**	306.28	226.61	73.99	79.67	26.01				
11	**Kollam**	323.35	271.53	83.97	51.82	16.03				
12	**Kasargod**	314.18	210.51	67	58.65	18.67	45.02	14.33		
13	**Alappuzha**	360.44	360.44	100						
14	**Palakkad**	567.68	423.49	74.6	52.47	9.24	91.73	16.16		
	Total	**5005.27**	**4107.22**	**82.06**	**761.3**	**15.21**	**136.74**	**2.73**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
MADHYA PRADESH										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Agar Malwa	404.03	108.3	26.81	104.57	25.88			191.16	47.31
2	Alirajpur	199.3	199.3	100						
3	Anuppur	269.94	224.12	83.03	45.82	16.97				
4	Ashoknagar	368.24	217.8	59.15	150.44	40.85				
5	Balaghat	719.49	719.49	100						
6	Barwani	520.36	356.7	68.55	102.51	19.7			61.16	11.75
7	Betul	977.5	722.52	73.91	254.99	26.09				
8	Bhind	899.54	899.54	100						
9	Bhopal	379.49			379.49	100				
10	Burhanpur	339.63	165.32	48.68	174.31	51.32				
11	Chhatarpur	809	434.9	53.76	374.1	46.24				
12	Chhindwara	976.05	665.39	68.17	211.48	21.67	99.18	10.16		
13	Damoh	365.76	308.65	84.39	57.11	15.61				
14	Datia	401.22	401.22	100						
15	Dewas	809.45	436.49	53.92	120.47	14.88			252.49	31.19
16	Dhar	1277.67	831.03	65.04			79.74	6.24	366.9	28.72
17	Dindori	332.58	332.58	100						
18	Guna	773.15	773.15	100						
19	Gwalior	757.74	708.4	93.49	49.34	6.51				
20	Harda	439.48	439.48	100						
21	Hoshangabad	1636.96	1453.86	88.81	183.1	11.19				
22	Indore	534.36			106.83	19.99	59	11.04	368.53	68.97
23	Jabalpur	612.97	580.94	94.78	32.03	5.22				
24	Jhabua	242.8	222.34	91.57	20.46	8.43				
25	Katni	380.29	380.29	100						
26	Khandwa	1051.96	933.15	88.71	118.81	11.29				
27	Khargone	921.48	864.84	93.85	56.64	6.15				
28	Mandla	467.72	467.72	100						
29	Mandsaur	631.81			315.37	49.91			316.45	50.09
30	Morena	646.16	646.16	100						
31	Narsinghpur	1127.62	916.14	81.25	211.48	18.75				
32	Neemuch	361.49			113.02	31.26			248.47	68.74
33	Niwari	181.2	112.16	61.9	69.04	38.1				
34	Panna	506.01	506.01	100						
35	Raisen	868.14	776.26	89.42	91.88	10.58				
36	Rajgarh	865.24			563.65	65.14	167.34	19.34	134.26	15.52
37	Ratlam	769.03			117.5	15.28			651.53	84.72
38	Rewa	498.21	461.18	92.57	37.03	7.43				
39	Sagar	1023.71	1023.71	100						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
MADHYA PRADESH											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
40	Satna	690.18	368.78	53.43	321.4	46.57				
41	Sehore	674.95	543.1	80.47			131.84	19.53		
42	Seoni	683.94	683.94	100						
43	Shahdol	531.72	531.72	100						
44	Shajapur	514.68			121.84	23.67			392.84	76.33
45	Sheopur	506.75	412.39	81.38	94.35	18.62				
46	Shivpuri	783.2	322.2	41.14	461	58.86				
47	Sidhi	292.12	292.12	100						
48	Singrauli	354.57	354.57	100						
49	Tikamgarh	364.29			364.29	100				
50	Ujjain	913.73			473.26	51.79			440.47	48.21
51	Umaria	342.39	342.39	100						
52	Vidisha	854.44	632.4	74.01	222.04	25.99				
	Total	**32853.75**	**22772.77**	**69.32**	**6119.62**	**18.63**	**537.1**	**1.63**	**3424.26**	**10.42**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
MAHARASHTRA										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Buldhana**	879.66	313.62	35.65	472.82	53.75			93.22	10.60
2	**Gondia**	623.67	623.67	100.00						
3	**Osmanabad**	815.81	565.57	69.33	250.24	30.67				
4	**Satara**	1054.43	806.25	76.46	248.18	23.54				
5	**Jalgaon**	1349.85	234.94	17.40	932.45	69.08			182.46	13.52
6	**Beed**	1235.05	1235.05	100.00						
7	**Nashik**	1873.61	1125.60	60.08	356.85	19.05	391.15	20.88		
8	**Nandurbar**	529.84	529.84	100.00						
9	**Sangli**	1312.68	1199.69	91.39	112.99	8.61				
10	**Parbhani**	820.66	820.66	100.00						
11	**Aurangabad**	1016.36	206.91	20.36	809.45	79.64				
12	**Jalna**	799.66	799.66	100.00						
13	**Latur**	655.45	557.24	85.02	98.21	14.98				
14	**Nagpur**	949.39	861.64	90.76	87.75	9.24				
15	**Ahmednagar**	1525.07	460.29	30.18	562.93	36.91	422.48	27.70	79.37	5.20
16	**Akola**	362.85	307.43	84.73	55.42	15.27				
17	**Amravati**	803.14	258.33	32.16	203.88	25.39	75.04	9.34	265.90	33.11
18	**Bhandara**	868.20	868.20	100.00						
19	**Chandrapur**	1109.03	1109.03	100.00						
20	**Dhule**	689.07	689.07	100.00						
21	**Gadchiroli**	1028.63	1028.63	100.00						
22	**Hingoli**	1056.05	1056.05	100.00						
23	**Nanded**	1180.27	1180.27	100.00						
24	**Palghar**	205.57	205.57	100.00						
25	**Pune**	1726.34	377.43	21.86	1199.62	69.49	149.28	8.65		
26	**Raigad**	356.23	356.23	100.00						
27	**Ratnagiri**	387.27	387.27	100.00						
28	**Sindhudurg**	220.87	220.87	100.00						
29	**Solapur**	1389.62	301.02	21.66	893.03	64.26			195.57	14.07
30	**Thane**	163.56	163.56	100.00						
31	**Wardha**	793.69	793.69	100.00						
32	**Washim**	556.72	556.72	100.00						
33	**Yawatmal**	1333.06	1333.06	100.00						
34	**Kolhapur**	1277.86	1277.86	100.00						
	Total	**30949.23**	**22810.91**	**73.70**	**6283.84**	**20.30**	**1037.96**	**3.35**	**816.52**	**2.64**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
MANIPUR											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Bishnupur**	107.22	107.22	100.00						
2	**Churachandpur**	74.58	74.58	100.00						
3	**Imphal East**	134.52	134.52	100.00						
4	**Imphal West**	78.29	78.29	100.00						
5	**Thoubal**	71.44	71.44	100.00						
	Total	**466.07**	**466.07**	**100.00**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
MEGHALAYA											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	
1	South West Khasi Hills	129.22	129.22	100							
2	South West Garo Hills	33.97	33.97	100							
3	West Garo Hills	161.68	161.68	100							
4	East Garo Hills	80.86	80.86	100							
5	East Jaintia Hills	152.58	152.58	100							
6	West Khasi Hills	285.35	285.35	100							
7	Ri Bhoi	59.59	59.59	100							
8	South Garo Hills	211.51	211.51	100							
9	West Jaintia Hills	101.31	101.31	100							
10	East Khasi Hills	208.02	208.02	100							
11	North Garo Hills	83.51	83.51	100							
	Total	**1507.61**	**1507.61**	**100**							

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
MIZORAM											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	
1	**Champhai**	15.38	15.38	100							
2	**Aizawl**	14.72	14.72	100							
3	**Serchhip**	8.12	8.12	100							
4	**Lunglei**	49.32	49.32	100							
5	**Saiha**	7.28	7.28	100							
6	**Kolasib**	25.03	25.03	100							
7	**Lawngtlai**	29.23	29.23	100							
8	**Mamit**	50.48	50.48	100							
	Total	**199.56**	**199.56**	**100**							

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
NAGALAND										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Kiphire	4.6	4.6	100						
2	Zunheboto	15.79	15.79	100						
3	Wokha	78.07	78.07	100						
4	Kohima	39.08	39.08	100						
5	Longleng	13.53	13.53	100						
6	Mon	41.64	41.64	100						
7	Peren	53.79	53.79	100						
8	Phek	16.73	16.73	100						
9	Dimapur	197.2	197.2	100						
10	Tuensang	25.94	25.94	100						
11	Mokokchung	56.39	56.39	100						
	Total	**542.76**	**542.76**	**100**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
ODISHA											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	
1	**Angul**	529.84	499.21	94.22	30.63	5.78					
2	**Balasore**	1291.42	1227.75	95.07	63.67	4.93					
3	**Bargarh**	618.29	618.29	100							
4	**Bhadrak**	535.36	535.36	100							
5	**Bolangir**	564.29	564.29	100							
6	**Boudh**	237.22	237.22	100							
7	**Cuttack**	688.9	688.9	100							
8	**Deogarh**	303.97	303.97	100							
9	**Dhenkanal**	447.74	447.74	100							
10	**Gajapati**	199.61	199.61	100							
11	**Ganjam**	945.78	945.78	100							
12	**Jagatsinghpur**	447.3	447.3	100							
13	**Jajpur**	532.86	436.09	81.84	96.77	18.16					
14	**Jharsuguda**	193.27	154.18	79.78	39.09	20.22					
15	**Kalahandi**	614.46	614.46	100							
16	**Kandhamal**	335.95	335.95	100							
17	**Kendrapara**	167.31	167.31	100							
18	**Keonjhar**	835.62	835.62	100							
19	**Khurda**	428.5	285.27	66.57	143.23	33.43					
20	**Koraput**	520.8	520.8	100							
21	**Malkangiri**	334.06	334.06	100							
22	**Mayurbhanj**	1364.22	1364.22	100							
23	**Nabarangapur**	541.72	541.72	100							
24	**Nayagarh**	355.48	316.23	88.96	39.25	11.04					
25	**Nuapada**	306.29	219.19	71.56	87.1	28.44					
26	**Puri**	608.36	608.36	100							
27	**Rayagada**	331.78	331.78	100							
28	**Sambalpur**	592.41	592.41	100							
29	**Subarnapur**	252.96	252.96	100							
30	**Sundargarh**	807.97	807.97	100							
	Total	**15933.74**	**15434.01**	**96.86**	**499.73**	**3.14**					

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023

PUNJAB

S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Fazilka	702.72	455.57	64.83	58.69	8.35			188.46	26.82
2	Pathankot	430.31	352.49	81.91	77.82	18.09				
3	Sas Nagar	203.14			42.19	20.77	70.13	34.52	90.82	44.71
4	Muktsar	834.4	834.4	100						
5	Kapurthala	603.17							603.17	100
6	Hoshiarpur	797.57	52.68	6.6	243.48	30.53			501.41	62.87
7	Amritsar	1332.21							1332.21	100
8	Barnala	498.78							498.78	100
9	Sangrur	636.2							636.2	100
10	Malerkotla	194.17							194.17	100
11	Jalandhar	721.15							721.15	100
12	Mansa	644.26	188.3	29.23	233.3	36.21			222.65	34.56
13	Bathinda	1086.29	372.92	34.33	176.19	16.22	127.08	11.7	410.1	37.75
14	Fatehgarh Sahib	354.13							354.13	100
15	Faridkot	568.39							568.39	100
16	Rupnagar	388.44	150.53	38.75	75.63	19.47			162.28	41.78
17	Moga	749.1							749.1	100
18	Tarn Taran	614.09							614.09	100
19	Patiala	834.3							834.3	100
20	Sbs Nagar	491.57	30.05	6.11			112.45	22.88	349.07	71.01
21	Ludhiana	1433.97							1433.97	100
22	Firozpur	1324.58			420.93	31.78			903.65	68.22
23	Gurdaspur	1535.43	77.01	5.02	31.94	2.08			1426.47	92.9
	Total	**16978.36**	**2513.95**	**14.81**	**1360.17**	**8.01**	**309.67**	**1.82**	**12794.57**	**75.36**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
RAJASTHAN											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	
1	Dhaulpur	250.4							250.4	100	
2	Pratapgarh	204.88	30.25	14.77			17.21	8.4	157.42	76.83	
3	Alwar	717.08							717.08	100	
4	Dausa	251.35							251.35	100	
5	Bikaner	278.71	78.98	28.34	37.71	13.53			162.01	58.13	
6	Karauli	305.63			29.51	9.66			276.12	90.34	
7	Chittaurgarh	310.98							310.98	100	
8	Ajmer	341.63							341.63	100	
9	Bharatpur	362.67							362.67	100	
10	Jalor	437.82					69.78	15.94	368.04	84.06	
11	Baran	589.28			120.92	20.52	192.16	32.61	276.2	46.87	
12	Udaipur	290.29			18.64	6.42	174.75	60.2	96.89	33.38	
13	Jaisalmer	94.93							94.93	100	
14	Sirohi	268			57.61	21.5	64.87	24.21	145.52	54.3	
15	Tonk	400.32	52.66	13.16	70.81	17.69	103.54	25.87	173.3	43.29	
16	Rajsamand	104.26					39.91	38.28	64.36	61.72	
17	Jaipur	653.28							653.28	100	
18	Ganganagar	431.7	431.7	100							
19	Dungarpur	202.42	142.25	70.28	60.16	29.72					
20	Bhilwara	406.15							406.15	100	
21	Sawai Madhopur	398.05							398.05	100	
22	Jhunjhunu	220.96							220.96	100	
23	Bundi	304.22	43.01	14.14	78.77	25.89			182.44	59.97	
24	Jodhpur	367.34			21.43	5.83	32.34	8.8	313.57	85.36	
25	Barmer	345.19	28.65	8.3	23.57	6.83			292.96	84.87	
26	Jhalawar	502.95	67.75	13.47			104.24	20.73	330.97	65.8	
27	Churu	147.9	51.09	34.55					96.8	65.45	
28	Hanumangarh	202.41	165.2	81.62	37.21	18.38					
29	Banswara	208.52	127.86	61.32	80.66	38.68					
30	Sikar	332.1			50.31	15.15			281.78	84.85	
31	Pali	289.35	3.23	1.12	10.11	3.49			276.01	95.39	
32	Kota	464.18			238.37	51.35			225.81	48.65	
33	Nagaur	566.44					59.08	10.43	507.36	89.57	
	Total	**11251.35**	**1222.65**	**10.87**	**935.81**	**8.32**	**857.87**	**7.62**	**8235.03**	**73.19**	

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
SIKKIM										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Mangan**	34.88	34.88	100						
2	**Soreng**	11.01	11.01	100						
3	**Namchi**	30.07	30.07	100						
4	**Pakyong**	45.84	45.84	100						
5	**Gangtok**	62.88	62.88	100						
6	**Gyalshing**	34	34	100						
	Total	**218.68**	**218.68**	**100**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
TAMIL NADU										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Ariyalur	355.21	319.22	89.87	36.00	10.13	0.00	0.00	0.00	0.00
2	Chengalpattu	530.69	217.22	40.93	313.47	59.07	0.00	0.00	0.00	0.00
3	Chennai	92.21	20.12	21.82	8.49	9.20	0.00	0.00	63.60	68.98
4	Coimbatore	516.44	130.18	25.21	21.67	4.20	139.56	27.02	225.03	43.57
5	Cuddalore	1011.12	607.64	60.10	0.00	0.00	160.79	15.90	242.69	24.00
6	Dharmapuri	442.12	87.84	19.87	40.18	9.09	63.06	14.26	251.04	56.78
7	Dindigul	555.51	74.33	13.38	0.00	0.00	89.68	16.14	391.49	70.47
8	Erode	674.01	233.38	34.63	227.82	33.80	47.48	7.04	165.33	24.53
9	Kallakurichchi	634.28	259.13	40.85	152.71	24.08	222.44	35.07	0.00	0.00
10	Kancheepuram	507.32	369.97	72.93	137.34	27.07	0.00	0.00	0.00	0.00
11	Kanniyakumari	308.65	308.65	100.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Karur	306.56	0.00	0.00	83.07	27.10	90.91	29.65	132.58	43.25
13	Krishnagiri	446.16	147.67	33.10	39.17	8.78	104.14	23.34	155.18	34.78
14	Madurai	702.35	454.24	64.67	230.82	32.86	17.29	2.46	0.00	0.00
15	Mayiladuthurai	310.64	0.00	0.00	0.00	0.00	0.00	0.00	310.64	100.00
16	Namakkal	501.87	21.68	4.32	46.52	9.27	0.00	0.00	433.67	86.41
17	Perambalur	228.14	59.24	25.97	0.00	0.00	0.00	0.00	168.89	74.03
18	Pudukkottai	896.54	759.44	84.71	137.10	15.29	0.00	0.00	0.00	0.00
19	Ramanathapuram	699.06	699.06	100.00	0.00	0.00	0.00	0.00	0.00	0.00
20	Ranipet	310.57	0.00	0.00	212.85	68.54	50.39	16.22	47.33	15.24
21	Salem	531.64	11.82	2.22	0.00	0.00	34.52	6.49	485.29	91.28
22	Sivagangai	604.81	604.81	100.00	0.00	0.00	0.00	0.00	0.00	0.00
23	Tenkasi	545.40	234.07	42.92	187.52	34.38	0.00	0.00	123.81	22.70
24	Thanjavur	922.65	0.00	0.00	67.67	7.33	535.65	58.06	319.33	34.61
25	The Nilgiris	89.18	89.18	100.00	0.00	0.00	0.00	0.00	0.00	0.00
26	Theni	274.79	73.99	26.92	146.61	53.35	54.20	19.72	0.00	0.00
27	Thiruvarur	212.05	143.37	67.61	0.00	0.00	0.00	0.00	68.68	32.39
28	Thoothukudi	516.58	467.53	90.51	49.04	9.49	0.00	0.00	0.00	0.00
29	Tiruchirappalli	721.07	407.78	56.55	44.27	6.14	0.00	0.00	269.03	37.31
30	Tirunelveli	752.42	639.31	84.97	113.11	15.03	0.00	0.00	0.00	0.00
31	Tirupathur	110.01	0.00	0.00	0.00	0.00	0.00	0.00	110.01	100.00
32	Tiruppur	547.83	0.00	0.00	353.02	64.44	101.56	18.54	93.25	17.02
33	Tiruvallur	785.57	718.26	91.43	67.31	8.57	0.00	0.00	0.00	0.00
34	Tiruvannamalai	1108.77	276.46	24.93	495.13	44.66	207.89	18.75	129.28	11.66
35	Vellore	186.31	0.00	0.00	42.97	23.06	0.00	0.00	143.34	76.94
36	Villupuram	951.06	221.79	23.32	225.00	23.66	61.17	6.43	443.09	46.59
37	Virudhunagar	616.13	270.58	43.92	297.21	48.24	48.34	7.85	0.00	0.00
	Total	**19505.70**	**8927.94**	**45.77**	**3776.07**	**19.36**	**2029.09**	**10.40**	**4772.59**	**24.47**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
TELANGANA										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Jagtial	499.84	467.69	93.57	32.15	6.43				
2	Karimnagar	857.43	833.77	97.24	23.65	2.76				
3	Kamareddy	638.07	580.97	91.05	57.10	8.95				
4	Medak	468.90	408.98	87.22	59.91	12.78				
5	Nirmal	610.14	610.14	100.00						
6	Mahabubnagar	336.29	293.60	87.31	42.69	12.69				
7	Narayanpet	287.73	287.73	100.00						
8	Suryapet	1408.49	1408.49	100.00						
9	Adilabad	667.22	661.29	99.11			3.71	0.56	2.22	0.33
10	Khammam	1271.31	1240.84	97.60	30.47	2.40				
11	Jayashankar Bhupalapally	404.88	404.88	100.00						
12	Nalgonda	1388.90	1203.23	86.63	185.68	13.37				
13	Wanaparthy	632.15	632.15	100.00						
14	Rangareddy	648.68	602.15	92.83	46.53	7.17				
15	Rajanna Siricilla	424.89	333.43	78.48	91.46	21.52				
16	Komarambheem Asifabad	599.24	599.24	100.00						
17	Mulug	520.88	520.88	100.00						
18	Hyderabad	58.08			23.22	39.98	22.59	38.89	12.27	21.13
19	Peddapalle	721.86	721.86	100.00						
20	Bhadradri Kothagudem	976.76	873.20	89.40	103.56	10.60				
21	Jangaon	363.65	337.71	92.87	25.94	7.13				
22	Jogulamba Gadwal	468.45	452.39	96.57	16.06	3.43				
23	Mahabubabad	570.48	551.69	96.71	18.78	3.29				
24	Mancherial	912.86	912.86	100.00						
25	Medchal Malkajgiri	88.79	73.32	82.57	10.85	12.22			4.63	5.21
26	Nagarkurnool	866.81	830.98	95.87	35.83	4.13				
27	Nizamabad	969.30	781.45	80.62	186.89	19.28			0.96	0.10
28	Sangareddy	407.69	346.63	85.02	43.42	10.65	17.63	4.32		
29	Siddipet	610.14	467.97	76.70	112.73	18.48	29.44	4.82		
30	Vikarabad	482.26	482.26	100.00						
31	Warangal	475.05	475.05	100.00						
32	Hanumakonda	446.80	337.21	75.47	85.72	19.19	23.87	5.34		
33	Yadadri Bhuvanagiri	836.92	800.81	95.69	36.11	4.31				
	Total	**20920.92**	**19534.85**	**93.37**	**1268.76**	**6.06**	**97.23**	**0.46**	**20.08**	**0.10**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
TRIPURA										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Dhalai**	153.88	153.88	100						
2	**North Tripura**	84.99	84.99	100						
3	**Khowai**	100.84	100.84	100						
4	**Gomati**	178.84	178.84	100						
5	**West Tripura**	141.49	141.49	100						
6	**Unakoti**	82.3	82.3	100						
7	**South Tripura**	200.14	200.14	100						
8	**Sepahijala**	151.57	151.57	100						
	Total	**1094.05**	**1094.05**	**100**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
UTTAR PRADESH										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Lalitpur	367.67			367.67	100				
2	Saharanpur	1312.72	115.29	8.78	701.72	53.46			495.71	37.76
3	Banda	664.36	367.5	55.32	296.86	44.68				
4	Mathura	1267.6	901.84	71.15			227.67	17.96	138.08	10.89
5	Shamli	430.35			76.8	17.85	177.18	41.17	176.38	40.98
6	Chandauli	506.75	506.75	100						
7	Mirzapur	557.8	401.46	71.97	111.43	19.98	30.75	5.51	14.16	2.54
8	Unnao	1562.56	1562.56	100						
9	Bagpat	335.51			191.87	57.19			143.63	42.81
10	Kanpur Dehat	732.12	184.47	25.2	547.65	74.8				
11	Chitrakoot	402.3	93.95	23.35	201.53	50.1	106.81	26.55		
12	Shahjahanpur	1240.15	1240.15	100						
13	Pilibhit	1036.95	1036.95	100						
14	Jaunpur	1178.23	755.01	64.08	313.9	26.64	109.32	9.28		
15	Mahrajganj	1022.54	1022.54	100						
16	Ambedkar Nagar	717.95	636.91	88.71	81.04	11.29				
17	Maunath Bhanjan	466.3	466.3	100						
18	Kaushambi	447.42	132.95	29.72	249.39	55.74			65.07	14.54
19	Raibareli	1118.25	1118.25	100						
20	Auraiya	597.85	597.85	100						
21	Etawah	646.1	646.1	100						
22	Mahoba	279.58			171.45	61.33			108.13	38.67
23	Sitapur	1821.94	1821.94	100						
24	Hathras	652.61	158.73	24.32	241.6	37.02	76.49	11.72	175.78	26.94
25	Budaun	765.99	240.29	31.37	338.45	44.18	94.63	12.35	92.62	12.09
26	Bulandshahar	1450.63	92.95	6.41	560.49	38.64	343.11	23.65	454.07	31.3
27	Amethi	798.21	763.91	95.7	34.3	4.3				
28	Bareilly	1136.15	915.16	80.55	200.96	17.69			20.03	1.76
29	Gonda	1108.72	1108.72	100						
30	Jhansi	646.58	405.19	62.67	241.38	37.33				
31	Aligarh	902.25	391.5	43.39	435.77	48.3	56.92	6.31	18.06	2
32	Bijnor	1334.41	756.92	56.72	463.85	34.76	113.64	8.52		
33	G.B.Nagar	471.78			100.06	21.21	254.58	53.96	117.15	24.83
34	Gorakhpur	1553.92	1553.92	100						
35	Kannauj	548.46	330.66	60.29	102.75	18.73	43.71	7.97	71.35	13.01
36	Etah	755.18	273.99	36.28	481.19	63.72				
37	Varanasi	479.67	124.37	25.93	170.12	35.47	49.67	10.36	135.51	28.25
38	Lucknow	734.9	659.43	89.73					75.46	10.27
39	Firozabad	725.45			348.7	48.07	57.75	7.96	319	43.97

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
UTTAR PRADESH										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
40	Azamgarh	1230.33	1230.33	100						
41	Deoria	1336.15	1336.15	100						
42	Balrampur	841.12	841.12	100						
43	Basti	754.4	754.4	100						
44	Ayodhya	844.3	844.3	100						
45	Agra	809.54			299.43	36.99	48.8	6.03	461.31	56.98
46	Hapur	459.56			83.75	18.22	212.46	46.23	163.35	35.54
47	Pratapgarh	1264.22	381.07	30.14	575.84	45.55	307.31	24.31		
48	Bahraich	1342.57	1342.57	100						
49	Mainpuri	839.33	614.65	73.23	180.39	21.49			44.29	5.28
50	Kushi Nagar	1550.94	1550.94	100						
51	Meerut	754.03	244.68	32.45	409.18	54.27	82.65	10.96	17.52	2.32
52	Ghaziabad	375.08			119.27	31.8			255.81	68.2
53	Fatehpur	1039.93	562.84	54.12	361.73	34.78			115.37	11.09
54	Kasganj	690.42	445.6	64.54	244.81	35.46				
55	Moradabad	603	98.12	16.27	436.56	72.4	51.76	8.58	16.56	2.75
56	Barabanki	1827.65	1827.65	100						
57	Sambhal	432.67	58.9	13.61	157.55	36.41	216.22	49.97		
58	Sant Kabir Nagar	490.8	490.8	100						
59	Lakhimpur Kheri	2100.3	2100.3	100						
60	Sant Ravidas Nagar	776.69			776.69	100				
61	Shrawasti	515.19	515.19	100						
62	Amroha	733.66			393.32	53.61	233.85	31.87	106.49	14.51
63	Kanpur Nagar	797.91	211.35	26.49	452.58	56.72	133.98	16.79		
64	Siddharth Nagar	868.77	868.77	100						
65	Ghazipur	949.32	884.13	93.13	65.19	6.87				
66	Sonbhadra	518.51	479.64	92.5	38.87	7.5				
67	Hamirpur	407.54	285.26	70	122.28	30				
68	Ballia	835.12	835.12	100						
69	Farrukhabad	401.83	195.71	48.71	206.11	51.29				
70	Hardoi	1583.12	1583.12	100						
71	Jalaun	941.87	941.87	100						
72	Muzaffarnagar	1042.01	644.97	61.9	137.33	13.18	166.64	15.99	93.08	8.93
73	Prayagraj	1284.22	766.97	59.72	413.42	32.19	80.48	6.27	23.34	1.82
74	Rampur	703.36	231.56	32.92	471.8	67.08				
75	Sultanpur	848.4	848.4	100						
	Total	**65571.79**	**45401.02**	**69.24**	**12977.06**	**19.79**	**3276.41**	**5**	**3917.31**	**5.97**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
UTTARAKHNAD											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Dehradun**	543.8	543.8	100						
2	**Haridwar**	435.02	248.33	57.09	186.69	42.91				
3	**Nainital**	173.9	95.38	54.85	78.52	45.15				
4	**Udhamsingh Nagar**	694.22	598.56	86.22	95.66	13.78				
	Total	**1846.93**	**1486.07**	**80.46**	**360.87**	**19.54**				

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
WEST BENGAL											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Purba Barddhaman	1851.03	1524.67	82.37	326.37	17.63				
2	Murshidabad	1861.47	1438.95	77.3	338.09	18.16	84.44	4.54		
3	Jhargram	952.28	952.28	100						
4	North 24 Parganas	1435.38	611.72	42.62	459.85	32.04	363.8	25.35		
5	Koch Bihar	1924.56	1924.56	100						
6	Malda	1074.17	1038.28	96.66	35.89	3.34				
7	Paschim Barddhaman	230.4	209.66	91	20.74	9				
8	Kalimpong	35.26	35.26	100						
9	Alipurduar	1212.15	1212.15	100						
10	Uttar Dinajpur	1104.29	1104.29	100						
11	South 24 Parganas									
12	Darjiling	377.87	377.87	100						
13	Hugli	1179.53	988.55	83.81	190.98	16.19				
14	Puruliya	536.17	536.17	100						
15	Kolkatta									
16	Haora	196.87	196.87	100						
17	Bankura	1627.18	1627.18	100						
18	Jalpaiguri	1667.23	1667.23	100						
19	Dakshin Dinajpur	1034.51	841.79	81.37	192.73	18.63				
20	Nadia	1715.63	163.78	9.55	663.25	38.66	888.6	51.79		
21	Birbhum	1087.91	1087.91	100						
22	Purba Medinipur	604.04	604.04	100						
23	Paschim Medinipur	2192.76	1932.49	88.13	260.27	11.87				
	Total	**23900.68**	**20075.68**	**84**	**2488.15**	**10.41**	**1336.84**	**5.59**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
ANDAMAN & NICOBAR ISLAND										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**N & M Andaman**	147.5	147.5	100						
2	**Nicobar**	311.98	311.98	100						
3	**South Andaman**	97.11	97.11	100						
	Total	**556.59**	**556.59**	**100**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
CHANDIGARH										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Chandigarh	48.41			48.41	100				
	Total	**48.41**			**48.41**	**100**				

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
DADRA & NAGAR HAVELI										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Dadra Nagar Haveli	81.71							81.71	100
	Total	81.71							81.71	100

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
DAMAN & DIU										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Daman**	27.89							27.89	100
2	**Diu**	5.57							5.57	100
	Total	**33.47**							**33.47**	**100**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
JAMMU & KASHMIR											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Bandipora	11.77	11.77	100						
2	Ganderbal	10.78	10.78	100						
3	Doda	9.95	9.95	100						
4	Anantnag	248.67	248.67	100						
5	Ramban	14.03	14.03	100						
6	Srinagar Urban	104.35			104.35	100				
7	Budgam	282.96	282.96	100						
8	Jammu	936.99	936.99	100						
9	Pulwama	247.79	247.79	100						
10	Reasi	63.89	63.89	100						
11	Samba	210.64	210.64	100						
12	Kathua	430.92	430.92	100						
13	Kishtwar	15.22	15.22	100						
14	Kulgam	124.39	124.39	100						
15	Kupwara	332.84	332.84	100						
16	Poonch	181.01	181.01	100						
17	Udhampur	160.81	160.81	100						
18	Rajouri	334.22	334.22	100						
19	Shopian	162.67	162.67	100						
20	Baramulla	579.35	579.35	100						
	Total	**4463.26**	**4358.92**	**97.66**	**104.35**	**2.34**				

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
LADAKH											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	
1	**Leh**	51.48	27.92	54.24	23.56	45.76					
2	**Kargil**	28.49	28.49	100							
	Total	**79.97**	**56.41**	**70.54**	**23.56**	**29.46**					

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023											
LAKSHADWEEP											
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited		
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	Lakshadweep	5.47	4.135	75.59414991	1.335	24				
	Total	**5.47**	**4.135**	**75.59414991**	**1.335**	**24**				

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023										
PUDUCHERRY										
S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in Mcm)	Safe		Semi-Critical		Critical		Over-Exploited	
			Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%	Annual Extractable Resource (in Mcm)	%
1	**Puducherry**	142.27	2.17	1.53	116.03	81.56			24.06	16.91
2	**Karaikal**	38.72	38.72	100.00						
	Total	**180.99**	**40.89**	**22.59**	**116.03**	**64.11**			**24.06**	**13.30**

Annexure - III(E)

State-Wise Recharge worthy Area of Assessment Unit under Different Category in India (as in 2023)

AREA OF ASSESSMENT UNITS UNDER DIFFERENT CATEGORIES IN INDIA (2023)

S.No.	States/Union Territories	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area (in sq.km)	%	Recharge Worthy Area (in sq.km)	%	Recharge Worthy Area (in sq.km)	%	Recharge Worthy Area (in sq.km)	%	Recharge Worthy Area (in sq.km)	%
1	Andhra Pradesh	139599.85	126905.28	90.91	3936.09	2.82	775.78	0.56	1886.36	1.35	6096.33	4.37
2	Arunachal Pradesh	5721.38	5721.38	100								
3	Assam	68817.93	68617.51	99.71	200.42	0.29						
4	Bihar	90348.7	81259.91	89.94	7417.08	8.21	803.91	0.89	867.8	0.96		
5	Chhattisgarh	106078.71	88972.3	83.87	13987.35	13.19	3119.06	2.94				
6	Delhi	1487.61	330.23	22.2	233.73	15.71	306.4	20.6	617.25	41.49		
7	Goa	2209.59	2209.59	100								
8	Gujarat	162778.14	118697.61	72.92	11487.16	7.06	5258.1	3.23	18448.47	11.33	8886.8	5.46
9	Haryana	43205.82	12097.86	28	2558.1	5.92	2590.43	6	25959.44	60.08		
10	Himachal Pradesh	3468	3468	100								
11	Jharkhand	60646.73	56945.2	93.9	2169.13	3.58	1068.48	1.76	463.92	0.76		
12	Karnataka	170463.35	103043.09	60.45	22695.74	13.31	10443.17	6.13	34281.35	20.11		
13	Kerala	27047.53	22059.01	81.56	4211.15	15.57	777.38	2.87				
14	Madhya Pradesh	269333.27	190725.58	70.81	51803.76	19.23	4249.07	1.58	22554.86	8.37		
15	Maharashtra	259914.03	186285.52	71.67	56959.43	21.91	8857.49	3.41	7034.69	2.71	776.89	0.30
16	Manipur	2559	2559	100.00								
17	Meghalaya	8171.35	8171.35	100								
18	Mizoram	3149.41	3149.41	100								
19	Nagaland	3855.07	3855.07	100								
20	Odisha	121593.15	116071.86	95.46	3339.96	2.75					2181.33	1.79
21	Punjab	50175.27	8159.54	16.26	4307.45	8.58	1192.98	2.38	36515.3	72.78		
22	Rajasthan	317010.74	46451	14.65	19080.79	6.02	19808.7	6.25	222734.36	70.26	8935.89	2.82
23	Sikkim	1496	1496	100								
24	Tamil Nadu	108690.63	44392.74	40.84	19482.71	17.92	11773.78	10.83	31129.84	28.64	1911.56	1.76
25	Telangana	105777.24	96504.46	91.23	8510.64	8.05	605.70	0.57	156.44	0.15		
26	Tripura	6197.84	6197.84	100								
27	Uttar Pradesh	229555.18	151205.64	65.87	51620.24	22.49	11777.16	5.13	14952.13	6.51		
28	Uttarakhand	4993.04	4042.1	80.95	950.94	19.05						
29	West Bengal	79765.77	61634.14	77.27	5886.51	7.38	2737.02	3.43			9508.1	11.9
30	Andaman And Nicobar	2120.07	2120.07	100								
31	Chandigarh	114			114	100						
32	Dadra & Nagar Haveli	416							416	100		
	Daman & Diu	110.9							110.9	100		
33	Jammu And Kashmir	8664.25	7789.25	89.9	875	10.1						
34	Ladakh	963	632	65.63	331	34.37						
35	Lakshadweep	26.21	19.87	75.811	6.34	24						
36	Puducherry	483	170	35.20	252.35	52.25			40.65	8.42	20.00	4.14
	Grand Total	**2467007.76**	**1631959.41**	**66.15**	**292417.07**	**11.85**	**86144.61**	**3.49**	**418169.76**	**16.95**	**38316.90**	**1.55**

Annexure - III(F)

District–Wise Recharge Worthy Area of Assessment Unit under Different Category in India (as in 2023)

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
ANDHRA PRADESH													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Sri Potti Sriramulu Nellore**	9941.78	9941.78	100.00								
2	**Nandyal**	7061.82	7061.82	100.00								
3	**Srikakulam**	4466.89	3985.73	89.23	156.53	3.50	113.71	2.55	210.93	4.72		
4	**Vizianagaram**	4009.47	4009.47	100.00								
5	**Sri Sathya Sai**	7636.24	6225.54	81.53	492.87	6.45	122.97	1.61	794.86	10.41		
6	**Alluri Sitharama Raju**	6392.35	6392.35	100.00								
7	**Konaseema**	2079.95	1320.07	63.47							759.88	36.53
8	**Eluru**	6591.85	5627.11	85.36							964.74	14.64
9	**West Godavari**	2178.42	690.71	31.71							1487.71	68.29
10	**Bapatla**	3801.18	3638.93	95.73							162.25	4.27
11	**Palnadu**	6516.56	5641.54	86.57			539.10	8.27	335.92	5.15		
12	**Kakinada**	2881.24	2362.46	81.99							518.78	18.01
13	**Y.S.R Kadapa**	8804.66	8411.73	95.54	230.86	2.62			162.07	1.84		
14	**Ananthapuramu**	9464.79	9216.06	97.37	248.73	2.63						
15	**Chittoor**	6004.51	4792.75	79.82	1211.76	20.18						
16	**East Godavari**	2545.53	2300.61	90.38	244.92	9.62						
17	**Guntur**	2423.33	2165.85	89.38							257.48	10.62
18	**Krishna**	3880.56	1935.06	49.87							1945.50	50.13
19	**Kurnool**	7558.63	7558.63	100.00								
20	**Prakasam**	10231.91	8911.48	87.09	937.85	9.17			382.58	3.74		
21	**Visakhapatnam**	1001.67	1001.67	100.00								
22	**Anakapalli**	3459.23	3459.23	100.00								
23	**Annamayya**	6660.66	6248.08	93.81	412.58	6.19						
24	**Ntr**	3063.24	3063.24	100.00								
25	**Parvathipuram Manyam**	3318.11	3318.11	100.00								
26	**Tirupati**	7625.27	7625.27	100.00								
	Total	**139599.85**	**126905.28**	**90.91**	**3936.09**	**2.82**	**775.78**	**0.56**	**1886.36**	**1.35**	**6096.33**	**4.37**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
ARUNACHAL PRADESH													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Changlang**	530	530	100								
2	**East Kameng**	312.5	312.5	100								
3	**East Siang**	1101	1101	100								
4	**Lohit**	2000	2000	100								
5	**Lower Dibang Valley**	1200	1200	100								
6	**Lower Subansiri**	101.35	101.35	100								
7	**Papum Pare**	178.19	178.19	100								
8	**Tirap**	125	125	100								
9	**Upper Subansiri**	7	7	100								
10	**West Kameng**	61.75	61.75	100								
11	**West Siang**	104.59	104.59	100								
	Total	**5721.38**	**5721.38**	**100**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
ASSAM													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Dhemaji	3151.56	3151.56	100								
2	Bongaigaon	997.3	997.3	100								
3	Jorhat	2794.08	2794.08	100								
4	Kokrajhar	3270.3	3270.3	100								
5	Darrang	1576.54	1576.54	100								
6	Kamrup (M) Rural	458.7	458.7	100								
7	Hailakandi	1049.81	1049.81	100								
8	Kamrup (M) Urban	200.42			200.42	100						
9	Kamrup	2630.24	2630.24	100								
10	Karbi Anglong	6560.9	6560.9	100								
11	Nalbari	1036.3	1036.3	100								
12	Sonitpur	5132.24	5132.24	100								
13	Tinsukia	3717.57	3717.57	100								
14	Sibsagar	2644.59	2644.59	100								
15	Lakhimpur	2249.3	2249.3	100								
16	Dhubri	2143.92	2143.92	100								
17	Morigaon	1490.66	1490.66	100								
18	Nagaon	3773.41	3773.41	100								
19	Dima Hasao	2343	2343	100								
20	Chirang	1917.94	1917.94	100								
21	Golaghat	3481.4	3481.4	100								
22	Goalpara	1719.83	1719.83	100								
23	Baksa	2448.73	2448.73	100								
24	Karimganj	1676.48	1676.48	100								
25	Dibrugarh	3346.88	3346.88	100								
26	Cachar	2733.58	2733.58	100								
27	Udalguri	2001.69	2001.69	100								
28	Barpeta	2270.56	2270.56	100								
	Total	68817.93	68617.51	99.71	200.42	0.29						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
BIHAR													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	
1	Begusarai	1891.31	1595	84.33	296.31	15.67							
2	Supaul	2410.26	2410.26	100									
3	Banka	2673	2673	100									
4	Nawada	2456.58	1835.76	74.73	620.82	25.27							
5	Aurangabad	3090.54	3090.54	100									
6	Bhagalpur	2602.55	2602.55	100									
7	Kaimur	2980.4	2769.86	92.94	210.54	7.06							
8	Saharsa	1661.28	1661.28	100									
9	Bhojpur	2275.3	1690.43	74.29	584.87	25.71							
10	Sitamarhi	2185.2	2185.2	100									
11	Siwan	2223.07	2223.07	100									
12	West Champaran	3871.81	3871.81	100									
13	Araria	2789.37	2789.37	100									
14	Arwal	636.83	636.83	100									
15	Darbhanga	2504.29	2504.29	100									
16	East Champaran	3958.87	3958.87	100									
17	Gaya	4909.78	4108.82	83.69	800.96	16.31							
18	Jamui	2551.14	2551.14	100									
19	Jehanabad	932.57	340.83	36.55	334.92	35.91			256.82	27.54			
20	Katihar	3009.91	3009.91	100									
21	Khagaria	1485.72	1485.72	100									
22	Kishanganj	1911.43	1911.43	100									
23	Lakhisarai	1144.94	1144.94	100									
24	Madhepura	1788.4	1788.4	100									
25	Madhubani	3486.45	3486.45	100									
26	Munger	1331.42	1331.42	100									
27	Muzaffarpur	3042.77	1538.21	50.55	1148.01	37.73	236.58	7.78	119.97	3.94			
28	Nalanda	2316.46	973.78	42.04	1186.45	51.22	80.93	3.49	75.3	3.25			
29	Patna	3200.84	2238.81	69.94	787.81	24.61	65.35	2.04	108.87	3.4			
30	Purnea	3202.39	3202.39	100									
31	Rohtas	3751.43	3372.29	89.89	379.14	10.11							
32	Samastipur	2612.87	1596.96	61.12	852.82	32.64	95.16	3.64	67.93	2.6			
33	Saran	2629.57	2629.57	100									
34	Sheikhpura	662.59	569.13	85.89			93.46	14.11					
35	Sheohar	442.99	442.99	100									
36	Vaishali	1995.18	1309.41	65.63	214.43	10.75	232.43	11.65	238.91	11.97			
37	Buxar	1710.06	1710.06	100									
38	Gopalganj	2019.13	2019.13	100									
	Total	**90348.7**	**81259.91**	**89.94**	**7417.08**	**8.21**	**803.91**	**0.89**	**867.8**	**0.96**			

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
CHHATISGARH												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Balod**	2614.7	1292.95	49.45	984.95	37.67	336.8	12.88				
2	**Baloda Bazar**	4067.48	4067.48	100								
3	**Balrampur**	5661.31	5661.31	100								
4	**Bastar**	3835.33	3835.33	100								
5	**Bemetara**	2854.81			724.86	25.39	2129.95	74.61				
6	**Bijapur**	4377.29	4377.29	100								
7	**Bilaspur**	3175.95	1572.65	49.52	1603.3	50.48						
8	**Dantewada**	3118.66	3118.66	100								
9	**Dhamtari**	2487.06	1215.81	48.89	1271.25	51.11						
10	**Durg**	2319.99	762.33	32.86	1557.66	67.14						
11	**Gariaband**	2631.4	2036.1	77.38	595.3	22.62						
12	**Gourela-Pendra-Marwahi**	1651.23	1651.23	100								
13	**Janjgir-Champa**	2152.58	2152.58	100								
14	**Jashpur**	4510.05	4510.05	100								
15	**Kabirdham**	4239.63	3123.17	73.67	1116.46	26.33						
16	**Khairagarh-Chhuikhadan_Gandai**	1490.38	689.15	46.24	801.23	53.76						
17	**Kanker**	6260.36	5805.01	92.73	455.35	7.27						
18	**Kondagaon**	3722.41	3722.41	100								
19	**Korba**	4314.3	3843.14	89.08	471.16	10.92						
20	**Korea**	726.47	726.47	100								
21	**Mahasamund**	4597.2	3954.2	86.01	643	13.99						
22	**Manendragarh-Chirmiri_Bharatpur**	3298.4	3298.4	100								
23	**Mohla-Manpur_Ambagarhchowki**	1548.82	1548.82	100								
24	**Mungeli**	1639.42	1639.42	100								
25	**Narayanpur**	3510.43	3510.43	100								
26	**Raigarh**	3859.19	3110.89	80.61	748.3	19.39						
27	**Raipur**	2891.98	2239.67	77.44			652.31	22.56				
28	**Rajnandgaon**	2597.32	747.87	28.79	1849.45	71.21						
29	**Sakti**	1543.89	1543.89	100								
30	**Sarangarh-Bilairagh**	2276.38	1676.04	73.63	600.34	26.37						
31	**Sukma**	5211.99	5211.99	100								
32	**Surajpur**	2637.88	2073.14	78.59	564.74	21.41						
33	**Surguja**	4254.42	4254.42	100								
	Total	**106078.71**	**88972.30**	**83.87**	**13987.35**	**13.19**	**3119.06**	**2.94**				

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
DELHI												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**North**	291.14			118.18	40.59	25.38	8.72	147.58	50.69		
2	**South East**	103.52					103.52	100				
3	**South West**	305.16	128.53	42.12			67.84	22.23	108.79	35.65		
4	**East**	31.6					31.6	100				
5	**Nazul Land**	25.79	25.79	100								
6	**South**	157.85					24.72	15.66	133.13	84.34		
7	**Central**	79.31	54.54	68.77			19.64	24.77	5.13	6.46		
8	**New Delhi**	158.09							158.09	100		
9	**North West**	154.36	121.37	78.63	32.99	21.37						
10	**West**	110.54			73.6	66.58	26.46	23.94	10.48	9.48		
11	**North East**	35.67			8.96	25.11			26.71	74.89		
12	**Shahdara**	34.59					7.24	20.94	27.34	79.06		
	Total	**1487.61**	**330.23**	**22.2**	**233.73**	**15.71**	**306.4**	**20.6**	**617.25**	**41.49**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
GOA												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Goa North**	989.87	989.87	100								
2	**South Goa**	1219.72	1219.72	100								
	Total	**2209.59**	**2209.59**	**100**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
GUJARAT												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Ahmedabad	7077.26	2993.62	42.3	779.52	11.01	983.36	13.89	473.59	6.69	1847.17	26.1
2	Amreli	7478.47	6630.87	88.67	847.6	11.33						
3	Anand	3041.19	3041.19	100								
4	Arvalli	3103.72	3103.72	100								
5	Banaskantha	10501.35	1311.14	12.49	792.79	7.55			6164.31	58.7	2233.12	21.27
6	Bharuch	5462.98	5462.98	100								
7	Bhavnagar	7281.48	7281.48	100								
8	Botad	2484.8	2484.8	100								
9	Chhota Udepur	3264.93	3264.93	100								
10	Dahod	3519.71	3519.71	100								
11	Dang	1449.22	1449.22	100								
12	Devbhumi Dwarka	4206.37	4206.37	100								
13	Gandhinagar	2155.21			859.59	39.88			1295.62	60.12		
14	Gir Somnath	3285.88	3285.88	100								
15	Jamnagar	6423.48	6423.48	100								
16	Junagadh	5471.24	5471.24	100								
17	Kachchh	20491.36	12264.11	59.85			1480.74	7.23	6528	31.86	218.51	1.07
18	Kheda	3437.64	3437.64	100								
19	Mahesana	4407.48			1598.19	36.26	682.26	15.48	2127.03	48.26		
20	Mahisagar	2459.01	2459.01	100								
21	Morbi	4992.7	4236.59	84.86							756.1	15.14
22	Narmada	2509.95	1950.65	77.72	559.3	22.28						
23	Navsari	2167.82	2167.82	100								
24	Panchmahal	3254.74	3254.74	100								
25	Patan	5686.51			471.22	8.29	374.78	6.59	1008.62	17.74	3831.89	67.39
26	Porbandar	2305.41	2305.41	100								
27	Rajkot	7762.59	4479.54	57.71	2506.28	32.29	776.76	10.01				
28	Sabarkantha	4073.78	1634.11	40.11	2031.58	49.87			408.09	10.02		
29	Surat	4212.4	3769.19	89.48					443.21	10.52		
30	Surendranagar	9276.07	8753.08	94.36	522.99	5.64						
31	Tapi	3085.5	3085.5	100								
32	Vadodara	4063.99	2585.68	63.62	518.11	12.75	960.2	23.63				
33	Valsad	2383.88	2383.88	100								
	Total	**162778.14**	**118697.58**	**72.92**	**11487.17**	**7.06**	**5258.1**	**3.23**	**18448.47**	**11.33**	**8886.79**	**5.46**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
HARYANA												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Rohtak	1669.07	1669.07	100								
2	Karnal	2470.52					243.01	9.84	2227.51	90.16		
3	Kaithal	2274.14							2274.14	100		
4	Jind	2750.91	684.67	24.89	215.5	7.83			1850.75	67.28		
5	Kurukshetra	1684.2							1684.2	100		
6	Bhiwani	3286.95	1828.3	55.62					1458.66	44.38		
7	Ambala	1509.05			552.73	36.63	193.18	12.8	763.14	50.57		
8	Fatehabad	2525.12					749.44	29.68	1775.69	70.32		
9	Gurgaon	1222.46							1222.46	100		
10	Charkhi Dadri	1371.61	797.22	58.12					574.38	41.88		
11	Faridabad	655.61							655.61	100		
12	Hisar	4075.27	2829.19	69.42	506.33	12.42	329.89	8.1	409.85	10.06		
13	Jhajjar	1934.65	1934.65	100								
14	Mahendragarh	1917.88					405.55	21.15	1512.32	78.85		
15	Mewat	1369.06	578.78	42.28	171.5	12.53	208.39	15.22	410.4	29.98		
16	Palwal	1358.26	558.47	41.12	300.54	22.13	154.6	11.38	344.65	25.37		
17	Panchkula	506.72	398.44	78.63			108.28	21.37				
18	Panipat	1302.73							1302.73	100		
19	Rewari	1461.68					198.1	13.55	1263.58	86.45		
20	Sirsa	4269.93			533.84	12.5			3736.08	87.5		
21	Sonipat	2157.22	819.08	37.97					1338.15	62.03		
22	Yamuna Nagar	1432.77			277.65	19.38			1155.12	80.62		
	Total	43205.82	12097.87	28	2558.1	5.92	2590.44	6	25959.42	60.08		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
HIMACHAL PRADESH													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Kangra	1476.00	1476.00	100								
2	Mandi	159.00	159.00	100								
3	Sirmaur	358.00	358.00	100								
4	Solan	336.00	336.00	100								
5	Una	1139.00	1139.00	100								
	Total	3468	3468	100								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
JHARKHAND													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Godda	1664.02	1664.02	100								
2	Giridih	4400.79	4019.38	91.33	381.41	8.67						
3	Simdega	3090.6	3090.6	100								
4	Garhwa	2916.43	2706.62	92.81	209.81	7.19						
5	Pakur	1277.59	1277.59	100								
6	Ramgarh	1112.67	985.86	88.6			80	7.19	46.81	4.21		
7	Sahebganj	1144.09	1144.09	100								
8	Dumka	2813.67	2813.67	100								
9	East Singhbhum	2509.93	2306.69	91.9					203.24	8.1		
10	Bokaro	2624.43	2531.73	96.47					92.7	3.53		
11	Chatra	3260.87	3260.87	100								
12	Deoghar	1906.98	1554.72	81.53	352.26	18.47						
13	Dhanbad	1976.73	838.35	42.41	670.9	33.94	346.31	17.52	121.17	6.13		
14	Gumla	4071.15	4071.15	100								
15	Hazaribagh	3526.62	3416.42	96.88	110.2	3.12						
16	Jamtara	983.46	983.46	100								
17	Khunti	1670.05	1670.05	100								
18	Koderma	909.02	622.11	68.44	146.34	16.1	140.57	15.46				
19	Latehar	2385.13	2385.13	100								
20	Lohardaga	1275.63	1275.63	100								
21	Palamau	3473.44	3473.44	100								
22	Ranchi	3743.08	2943.27	78.63	298.21	7.97	501.6	13.4				
23	Saraikela Kharsawan	2028.01	2028.01	100								
24	West Singhbhum	5882.34	5882.34	100								
	Total	**60646.73**	**56945.2**	**93.9**	**2169.13**	**3.58**	**1068.48**	**1.76**	**463.92**	**0.76**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
KARNATAKA													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Bagalkot	6283.8	1482.52	23.59	2871.01	45.69	1060.16	16.87	870.11	13.85		
2	Ballari	3758.91	3758.91	100								
3	Belagavi	12956.29	5829.54	44.99	4785.49	36.94	1581.68	12.21	759.58	5.86		
4	Bengaluru (Rural)	2236.51							2236.51	100		
5	Bengaluru (Urban)	2130.26							2130.26	100		
6	Bidar	5453.14	4116.6	75.49	1336.54	24.51						
7	Chamarajanagara	3609.4			1415.42	39.21	1047.26	29.01	1146.72	31.77		
8	Chikkaballapura	3734.82							3734.82	100		
9	Chikkamagaluru	4234.94	2537.18	59.91					1697.76	40.09		
10	Chitradurga	8004.61	627.43	7.84					7377.18	92.16		
11	Dakshina Kannada	3308.67	3308.67	100								
12	Davanagere	4095.52	1225.87	29.93			947.99	23.15	1921.66	46.92		
13	Dharwad	4163.28	4163.28	100								
14	Gadag	4359.87	1288.84	29.56	1782.51	40.88	871.1	19.98	417.42	9.57		
15	Hassan	5962.97	3764.93	63.14			1040.78	17.45	1157.26	19.41		
16	Haveri	4737.54	3565.79	75.27	1171.75	24.73						
17	Kalburgi	10962.67	9653.24	88.06	1309.43	11.94						
18	Kodagu	2025.83	2025.83	100								
19	Kolara	3827.63							3827.63	100		
20	Koppal	5398.66	3435.96	63.64	1305.4	24.18	657.3	12.18				
21	Mandya	4817.43	4092.71	84.96	724.72	15.04						
22	Mysuru	6116.45	6116.45	100								
23	Raichur	8386.67	7649.31	91.21	737.36	8.79						
24	Ramanagara	2739.98			1174.07	42.85	1268.55	46.3	297.36	10.85		
25	Shivamogga	6747.31	6747.31	100								
26	Tumakuru	9915.97	2823.96	28.48	1203.95	12.14	598.58	6.04	5289.48	53.34		
27	Udupi	2869.98	2869.98	100								
28	Uttara Kannada	6585.48	6585.48	100								
29	Vijayanagara	5397.53	1697.85	31.46	912.31	16.9	1369.77	25.38	1417.6	26.26		
30	Vijayapura	10488.41	10122.45	96.51	365.96	3.49						
31	Yadgir	5152.82	3553	68.95	1599.82	31.05						
	Total	**170463.35**	**103043.09**	**60.45**	**22695.74**	**13.31**	**10443.17**	**6.13**	**34281.35**	**20.11**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
KERALA													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Kottayam	1970.88	1970.88	100								
2	Idukki	1088.91	854.63	78.48	234.28	21.52						
3	Wayanad	1427.62	1427.62	100								
4	Ernakulam	2269.47	2269.47	100								
5	Thiruvananthapuram	1942.97	1350.69	69.52	592.28	30.48						
6	Thrissur	2366.85	1977.08	83.53	389.77	16.47						
7	Pathanamthitta	1296.65	1296.65	100								
8	Kannur	2323.96	2002.78	86.18	321.18	13.82						
9	Malappuram	2541.81	1327.05	52.21	1214.76	47.79						
10	Kozhikkode	1661.8	1188.82	71.54	472.98	28.46						
11	Kollam	2112	1837.06	86.98	274.94	13.02						
12	Kasargod	1648.3	1058.18	64.2	331.36	20.1	258.76	15.7				
13	Alappuzha	1414.03	1414.03	100								
14	Palakkad	2982.28	2084.06	69.88	379.6	12.73	518.62	17.39				
	Total	**27047.53**	**22059**	**81.56**	**4211.15**	**15.57**	**777.38**	**2.87**				

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
MADHYA PRADESH												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Agar Malwa	2515.76	654.46	26.01	700.83	27.86			1160.47	46.13		
2	Alirajpur	3054	3054	100								
3	Anuppur	2942	2602	88.44	340	11.56						
4	Ashoknagar	4622.44	2462.59	53.27	2159.85	46.73						
5	Balaghat	8917.93	8917.93	100								
6	Barwani	3668.31	2646.15	72.14	730.36	19.91			291.8	7.95		
7	Betul	8564.5	6663.5	77.8	1901	22.2						
8	Bhind	4459	4459	100								
9	Bhopal	2648			2648	100						
10	Burhanpur	2570.5	1400.5	54.48	1170	45.52						
11	Chhatarpur	7904.34	3938.28	49.82	3966.06	50.18						
12	Chhindwara	8847.77	6631.89	74.96	1580.72	17.87	635.16	7.18				
13	Damoh	4746.19	3842.82	80.97	903.37	19.03						
14	Datia	2662	2662	100								
15	Dewas	5770.82	3313.7	57.42	876.31	15.19			1580.81	27.39		
16	Dhar	8126.4	5169	63.61			534	6.57	2423.4	29.82		
17	Dindori	4560	4560	100								
18	Guna	6175.14	6175.14	100								
19	Gwalior	4283	3859.65	90.12	423.35	9.88						
20	Harda	2700.9	2700.9	100								
21	Hoshangabad	5583.52	4914.52	88.02	669	11.98						
22	Indore	3818.97			1020.92	26.73	530	13.88	2268.05	59.39		
23	Jabalpur	4438.68	4070.28	91.7	368.4	8.3						
24	Jhabua	3112.53	2699.53	86.73	413	13.27						
25	Katni	4666.48	4666.48	100								
26	Khandwa	5814.46	4953.46	85.19	861	14.81						
27	Khargone	6568.97	6074.57	92.47	494.4	7.53						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
MADHYA PRADESH												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
28	Mandla	5739.9	5739.9	100								
29	Mandsaur	4956.4			2438.83	49.21			2517.57	50.79		
30	Morena	4384.89	4384.89	100								
31	Narsinghpur	4791	3947	82.38	844	17.62						
32	Neemuch	3757.44			1153	30.69			2604.44	69.31		
33	Niwari	1525.62	939.62	61.59	586	38.41						
34	Panna	6624.75	6624.75	100								
35	Raisen	6609.4	5745	86.92	864.4	13.08						
36	Rajgarh	6154.98			3881.98	63.07	1368	22.23	905	14.7		
37	Ratlam	4616			973	21.08			3643	78.92		
38	Rewa	5937.6	5490.3	92.47	447.3	7.53						
39	Sagar	9254.18	9254.18	100								
40	Satna	6721.06	3576.89	53.22	3144.17	46.78						
41	Sehore	4639.72	3457.81	74.53			1181.91	25.47				
42	Seoni	8050.2	8050.2	100								
43	Shahdol	4978	4978	100								
44	Shajapur	3406.17			883.07	25.93			2523.1	74.07		
45	Sheopur	5334.8	3697.8	69.31	1637	30.69						
46	Shivpuri	9770.49	4354.54	44.57	5415.95	55.43						
47	Sidhi	3604.05	3604.05	100								
48	Singrauli	4512.6	4512.6	100								
49	Tikamgarh	3355.38			3355.38	100						
50	Ujjain	5939.33			3302.11	55.6			2637.22	44.4		
51	Umaria	4219	4219	100								
52	Vidisha	6707.7	5056.7	75.39	1651	24.61						
	Total	**269333.27**	**190725.58**	**70.81**	**51803.76**	**19.23**	**4249.07**	**1.58**	**22554.86**	**8.37**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
MAHARASHTRA													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Buldhana	8206.15	2952.63	35.98	4195.07	51.12			1058.45	12.9		
2	Gondia	4597.05	4597.05	100								
3	Osmanabad	6716.28	4671.26	69.55	2045.02	30.45						
4	Satara	8775.07	6080.85	69.3	2694.22	30.7						
5	Jalgaon	11378.83	1777.93	15.62	7824.14	68.76			1776.76	15.61		
6	Beed	10352.05	10352.05	100								
7	Nashik	13488.56	7485.45	55.49	3096.05	22.95	2907.06	21.55				
8	Nandurbar	4152.78	4152.78	100								
9	Sangli	8427.58	7678.05	91.11	749.53	8.89						
10	Parbhani	6214	6214	100								
11	Aurangabad	9501.74	1889.75	19.89	7611.99	80.11						
12	Jalna	7718	7718	100								
13	Latur	6635.48	5724.75	86.27	910.73	13.73						
14	Nagpur	7990.42	7437.49	93.08	552.93	6.92						
15	Ahmednagar	15624.75	5172.01	33.1	5972.85	38.23	3825.41	24.48	654.48	4.19		
16	Akola	5141.65	4458.17	86.71	683.47	13.29						
17	Amravati	8392.39	2819.41	33.59	2105.96	25.09	638.12	7.6	2052.01	24.45	776.89	9.26
18	Bhandara	3964.97	3964.97	100								
19	Chandrapur	10476.57	10476.57	100								
20	Dhule	6421.32	6421.32	100								
21	Gadchiroli	8866.49	8866.49	100								
22	Hingoli	4662.41	4662.41	100								
23	Nanded	10177.71	10177.71	100								
24	Palghar	2760.86	2760.86	100								
25	Pune	12757.28	3018.35	23.66	8252.02	64.68	1486.91	11.66				
26	Raigad	3747.59	3747.59	100								
27	Ratnagiri	5113.07	5113.07	100								
28	Sindhudurg	2793.05	2793.05	100								
29	Solapur	14838.9	3080.47	20.76	10265.44	69.18			1492.99	10.06		
30	Thane	2334.47	2334.47	100								
31	Wardha	5812.16	5812.16	100								
32	Washim	4811.96	4811.96	100								
33	Yawatmal	11440.67	11440.67	100								
34	Kolhapur	5621.76	5621.76	100								
	Total	**259914.03**	**186285.52**	**71.67**	**56959.43**	**21.91**	**8857.49**	**3.41**	**7034.69**	**2.71**	**776.89**	**0.3**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
MANIPUR													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	
1	Bishnupur	496	496	100.00									
2	Churachandpur	321	321	100.00									
3	Imphal East	709	709	100.00									
4	Imphal West	519	519	100.00									
5	Thoubal	514	514	100.00									
	Total	2559	2559	100.00									

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
MEGHALAYA													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	South West Khasi Hills	485.37	485.37	100								
2	South West Garo Hills	425.2	425.2	100								
3	West Garo Hills	1277.84	1277.84	100								
4	East Garo Hills	502.15	502.15	100								
5	East Jaintia Hills	827.35	827.35	100								
6	West Khasi Hills	1239.7	1239.7	100								
7	Ri Bhoi	688.78	688.78	100								
8	South Garo Hills	659.57	659.57	100								
9	West Jaintia Hills	791.86	791.86	100								
10	East Khasi Hills	903.22	903.22	100								
11	North Garo Hills	370.31	370.31	100								
	Total	8171.35	8171.35	100								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
MIZORAM													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	
1	Champhai	286.73	286.73	100									
2	Aizawl	217.34	217.34	100									
3	Serchhip	161.66	161.66	100									
4	Lunglei	744.87	744.87	100									
5	Saiha	106.6	106.6	100									
6	Kolasib	395.15	395.15	100									
7	Lawngtlai	520.75	520.75	100									
8	Mamit	716.31	716.31	100									
	Total	3149.41	3149.41	100									

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
NAGALAND													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	
1	**Kiphire**	35.76	35.76	100									
2	**Zunheboto**	89.85	89.85	100									
3	**Wokha**	669.21	669.21	100									
4	**Kohima**	282.64	282.64	100									
5	**Longleng**	128.9	128.9	100									
6	**Mon**	615.12	615.12	100									
7	**Peren**	638.38	638.38	100									
8	**Phek**	113.09	113.09	100									
9	**Dimapur**	630.46	630.46	100									
10	**Tuensang**	101.23	101.23	100									
11	**Mokokchung**	550.43	550.43	100									
	Total	**3855.07**	**3855.07**	**100**									

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
ODISHA													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	
1	Angul	5085.85	4797.19	94.32	288.66	5.68							
2	Balasore	3564.77	3299.7	92.56	265.07	7.44							
3	Bargarh	5251.77	5251.77	100									
4	Bhadrak	2522.36	1901.92	75.4							620.44	24.6	
5	Bolangir	6297.77	6297.77	100									
6	Boudh	2140.98	2140.98	100									
7	Cuttack	3400.69	3400.69	100									
8	Deogarh	2185.29	2185.29	100									
9	Dhenkanal	3978.75	3978.75	100									
10	Gajapati	1424.58	1424.58	100									
11	Ganjam	6104.2	6104.2	100									
12	Jagatsinghpur	1889.88	1513.89	80.11							375.99	19.89	
13	Jajpur	2662.13	2333.95	87.67	328.18	12.33							
14	Jharsuguda	2118.42	1699.25	80.21	419.17	19.79							
15	Kalahandi	5581.37	5581.37	100									
16	Kandhamal	4473.71	4473.71	100									
17	Kendrapara	2263.44	1078.54	47.65							1184.9	52.35	
18	Keonjhar	6847.9	6847.9	100									
19	Khurda	2607.17	1607.13	61.64	1000.04	38.36							
20	Koraput	6006.06	6006.06	100									
21	Malkangiri	3398.99	3398.99	100									
22	Mayurbhanj	8340.16	8340.16	100									
23	Nabarangapur	5344.64	5344.64	100									
24	Nayagarh	2578.45	2381.27	92.35	197.18	7.65							
25	Nuapada	3083.04	2241.38	72.7	841.66	27.3							
26	Puri	2586.11	2586.11	100									
27	Rayagada	3659.73	3659.73	100									
28	Sambalpur	5670.92	5670.92	100									
29	Subarnapur	2320.54	2320.54	100									
30	Sundargarh	8203.48	8203.48	100									
	Total	**121593.15**	**116071.86**	**95.46**	**3339.96**	**2.75**					**2181.33**	**1.79**	

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
PUNJAB												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Fazilka	2739.54	1933.1	70.56	328.37	11.99			478.07	17.45		
2	Pathankot	781.36	538.44	68.91	242.92	31.09						
3	Sas Nagar	1093.83			280.64	25.66	422.75	38.65	390.44	35.69		
4	Muktsar	2634.28	2634.28	100								
5	Kapurthala	1628.75							1628.75	100		
6	Hoshiarpur	3368.71	225.73	6.7	1162.94	34.52			1980.04	58.78		
7	Amritsar	2676.4							2676.4	100		
8	Barnala	1413.01							1413.01	100		
9	Sangrur	2857.96							2857.96	100		
10	Malerkotla	745.29							745.29	100		
11	Jalandhar	2629.99							2629.99	100		
12	Mansa	2168.62	682.61	31.48	725.9	33.47			760.11	35.05		
13	Bathinda	3374.24	1055.74	31.29	332.58	9.86	445.59	13.21	1540.33	45.65		
14	Fatehgarh Sahib	1142.46							1142.46	100		
15	Faridkot	1475.98							1475.98	100		
16	Rupnagar	1376.53	724.28	52.62	320.31	23.27			331.94	24.11		
17	Moga	2230.96							2230.96	100		
18	Tarn Taran	2418.35							2418.35	100		
19	Patiala	3318.47							3318.47	100		
20	Sbs Nagar	1259.61	168.02	13.34			324.64	25.77	766.95	60.89		
21	Ludhiana	3707.15							3707.15	100		
22	Firozpur	2519.53			804.59	31.93			1714.94	68.07		
23	Gurdaspur	2614.25	197.34	7.55	109.2	4.18			2307.71	88.27		
	Total	**50175.27**	**8159.54**	**16.26**	**4307.45**	**8.58**	**1192.98**	**2.38**	**36515.3**	**72.78**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
RAJASTHAN													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Dhaulpur	2485.26							2485.26	100		
2	Pratapgarh	2950.39	483.5	16.39			458.56	15.54	2008.33	68.07		
3	Alwar	7201.61							7201.61	100		
4	Dausa	3085.62							3085.62	100		
5	Bikaner	30381.77	14440.01	47.53	1912.89	6.3			8575.63	28.23	5453.24	17.95
6	Karauli	3902.42			571.06	14.63			3331.36	85.37		
7	Chittaurgarh	5833.89							5833.89	100		
8	Ajmer	7466.76							7466.76	100		
9	Bharatpur	4751.52							4751.52	100		
10	Jalor	10251.53					1817.85	17.73	8433.68	82.27		
11	Baran	6892.21			949	13.77	2892.66	41.97	3050.55	44.26		
12	Udaipur	7770.92			389.44	5.01	4566.83	58.77	2814.65	36.22		
13	Jaisalmer	38145							38145	100		
14	Sirohi	4075.7			882.9	21.66	1103.05	27.06	2089.75	51.27		
15	Tonk	5881.74	911.14	15.49	1242.09	21.12	1378.9	23.44	2349.61	39.95		
16	Rajsamand	3540.09					1212.42	34.25	2327.67	65.75		
17	Jaipur	10334.72							10334.72	100		
18	Ganganagar	11141.59	11141.59	100								
19	Dungarpur	2634.13	2026.5	76.93	607.63	23.07						
20	Bhilwara	9354.85							9354.85	100		
21	Sawai Madhopur	4328.5							4328.5	100		
22	Jhunjhunu	5393.47							5393.47	100		
23	Bundi	4240.18	462.53	10.91	1152.88	27.19			2624.77	61.9		
24	Jodhpur	22189.72			1978.95	8.92	3833.9	17.28	16376.87	73.8		
25	Barmer	28578.58	1802.75	6.31	2094.66	7.33			24681.17	86.36		
26	Jhalawar	6096.26	978.04	16.04			1404.45	23.04	3713.77	60.92		
27	Churu	13793.01	3860.8	27.99					8121.81	58.88	1810.4	13.13
28	Hanumangarh	9579.6	6779.33	70.77	1128.02	11.78					1672.25	17.46
29	Banswara	3979.96	2186.91	54.95	1793.05	45.05						
30	Sikar	7356.92			1291.23	17.55			6065.69	82.45		
31	Pali	10551.39	1377.9	13.06	1279.91	12.13			7893.58	74.81		
32	Kota	5123.17			1807.08	35.27			3316.09	64.73		
33	Nagaur	17718.26					1140.08	6.43	16578.18	93.57		
	Total	**317010.74**	**46451**	**14.65**	**19080.79**	**6.02**	**19808.7**	**6.25**	**222734.36**	**70.26**	**8935.89**	**2.82**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023														
SIKKIM														
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline			
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%		
1	**Mangan**	200	200	100										
2	**Soreng**	98	98	100										
3	**Namchi**	280	280	100										
4	**Pakyong**	261	261	100										
5	**Gangtok**	355	355	100										
6	**Gyalshing**	302	302	100										
	Total	**1496**	**1496**	**100**										

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
TAMIL NADU												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Ariyalur	1926.59	1639.13	85.08	287.46	14.92	0.00	0.00	0.00	0.00	0.00	0.00
2	Chengalpattu	2424.15	1135.23	46.83	1288.92	53.17	0.00	0.00	0.00	0.00	0.00	0.00
3	Chennai	446.28	106.80	23.93	17.71	3.97	0.00	0.00	321.77	72.10	0.00	0.00
4	Coimbatore	3674.78	417.15	11.35	268.61	7.31	1076.88	29.30	1912.14	52.03	0.00	0.00
5	Cuddalore	3636.73	1546.18	42.52	0.00	0.00	659.93	18.15	1430.62	39.34	0.00	0.00
6	Dharmapuri	2812.87	640.56	22.77	231.84	8.24	498.99	17.74	1441.48	51.25	0.00	0.00
7	Dindigul	4877.41	788.32	16.16	0.00	0.00	697.38	14.30	3391.71	69.54	0.00	0.00
8	Erode	3448.82	849.17	24.62	966.17	28.01	405.75	11.76	1227.72	35.60	0.00	0.00
9	Kallakurichchi	2579.23	1112.07	43.12	597.46	23.16	869.70	33.72	0.00	0.00	0.00	0.00
10	Kancheepuram	1667.94	1246.02	74.70	421.92	25.30	0.00	0.00	0.00	0.00	0.00	0.00
11	Kanniyakumari	1130.45	1130.45	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Karur	2833.70	0.00	0.00	490.41	17.31	1006.43	35.52	1336.85	47.18	0.00	0.00
13	Krishnagiri	3103.26	1264.54	40.75	356.95	11.50	563.84	18.17	917.93	29.58	0.00	0.00
14	Madurai	3256.47	1923.40	59.06	1268.13	38.94	64.94	1.99	0.00	0.00	0.00	0.00
15	Mayiladuthurai	1162.56	0.00	0.00	0.00	0.00	0.00	0.00	1162.56	100.00	0.00	0.00
16	Nagapattinam	1538.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1538.44	100.00
17	Namakkal	2924.55	208.26	7.12	159.74	5.46	0.00	0.00	2556.55	87.42	0.00	0.00
18	Perambalur	1594.54	417.99	26.21	0.00	0.00	0.00	0.00	1176.55	73.79	0.00	0.00
19	Pudukkottai	4427.94	3521.69	79.53	906.25	20.47	0.00	0.00	0.00	0.00	0.00	0.00
20	Ramanathapuram	4074.87	4074.87	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	Ranipet	1755.84	0.00	0.00	1217.02	69.31	287.02	16.35	251.81	14.34	0.00	0.00
22	Salem	3915.35	152.49	3.89	0.00	0.00	272.91	6.97	3489.95	89.13	0.00	0.00
23	Sivagangai	4032.62	4032.62	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	Tenkasi	2442.44	734.10	30.06	872.06	35.70	0.00	0.00	836.28	34.24	0.00	0.00
25	Thanjavur	3394.70	0.00	0.00	333.57	9.83	1967.86	57.97	1093.27	32.21	0.00	0.00
26	The Nilgiris	1119.08	1119.08	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	Theni	1894.17	590.34	31.17	911.19	48.11	392.64	20.73	0.00	0.00	0.00	0.00
28	Thiruvarur	2072.57	1068.28	51.54	0.00	0.00	0.00	0.00	631.17	30.45	373.12	18.00
29	Thoothukudi	4597.12	4242.76	92.29	354.36	7.71	0.00	0.00	0.00	0.00	0.00	0.00
30	Tiruchirappalli	4036.10	1547.41	38.34	370.63	9.18	0.00	0.00	2118.06	52.48	0.00	0.00
31	Tirunelveli	3043.87	2419.93	79.50	623.95	20.50	0.00	0.00	0.00	0.00	0.00	0.00
32	Tirupathur	1208.37	0.00	0.00	0.00	0.00	0.00	0.00	1208.37	100.00	0.00	0.00
33	Tiruppur	4713.91	0.00	0.00	2424.85	51.44	1289.33	27.35	999.73	21.21	0.00	0.00
34	Tiruvallur	3042.19	2708.05	89.02	334.14	10.98	0.00	0.00	0.00	0.00	0.00	0.00
35	Tiruvannamalai	4773.45	838.28	17.56	1954.62	40.95	1055.82	22.12	924.72	19.37	0.00	0.00
36	Vellore	1333.11	0.00	0.00	274.73	20.61	0.00	0.00	1058.38	79.39	0.00	0.00
37	Villupuram	3772.29	959.10	25.42	885.01	23.46	285.96	7.58	1642.22	43.53	0.00	0.00
38	Virudhunagar	4001.89	1958.48	48.94	1665.03	41.61	378.38	9.45	0.00	0.00	0.00	0.00
	Total	**108690.63**	**44392.74**	**40.84**	**19482.71**	**17.92**	**11773.78**	**10.83**	**31129.84**	**28.64**	**1911.56**	**1.76**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
TELANGANA												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Jagtial**	2667.15	2428.19	91.04	238.96	8.96						
2	**Karimnagar**	2066.96	1934.30	93.58	132.66	6.42						
3	**Kamareddy**	3488.32	3134.77	89.86	353.54	10.14						
4	**Medak**	2545.57	2188.42	85.97	357.15	14.03						
5	**Nirmal**	3264.37	3264.37	100.00								
6	**Mahabubnagar**	2542.63	2212.64	87.02	330.00	12.98						
7	**Narayanpet**	2318.11	2318.11	100.00								
8	**Suryapet**	3607.50	3607.50	100.00								
9	**Adilabad**	3809.49	3740.51	98.19			43.10	1.13	25.88	0.68		
10	**Khammam**	4281.59	4091.87	95.57	189.72	4.43						
11	**Jayashankar Bhupalapally**	2305.20	2305.20	100.00								
12	**Nalgonda**	7046.73	5289.41	75.06	1757.32	24.94						
13	**Wanaparthy**	2081.70	2081.70	100.00								
14	**Rangareddy**	4826.98	4450.00	92.19	376.97	7.81						
15	**Rajanna Siricilla**	1731.39	1329.65	76.80	401.74	23.20						
16	**Komarambheem Asifabad**	3768.16	3768.16	100.00								
17	**Mulug**	2837.31	2837.31	100.00								
18	**Hyderabad**	217.82			87.09	39.98	84.71	38.89	46.02	21.13		
19	**Peddapalle**	1940.64	1940.64	100.00								
20	**Bhadradri Kothagudem**	7108.43	6470.80	91.03	637.63	8.97						
21	**Jangaon**	2107.13	1928.87	91.54	178.26	8.46						
22	**Jogulamba Gadwal**	2603.69	2427.45	93.23	176.24	6.77						
23	**Mahabubabad**	3344.59	3241.63	96.92	102.97	3.08						
24	**Mancherial**	3983.25	3983.25	100.00								
25	**Medchal Malkajgiri**	1038.07	821.59	79.15	134.65	12.97			81.82	7.88		
26	**Nagarkurnool**	6172.65	5948.54	96.37	224.11	3.63						
27	**Nizamabad**	4129.91	3172.14	76.81	955.05	23.13			2.72	0.07		
28	**Sangareddy**	4110.61	3455.89	84.07	479.82	11.67	174.90	4.25				
29	**Siddipet**	3407.27	2548.04	74.78	689.55	20.24	169.68	4.98				
30	**Vikarabad**	3672.96	3672.96	100.00								
31	**Warangal**	1713.37	1713.37	100.00								
32	**Hanumakonda**	1604.85	949.78	59.18	521.75	32.51	133.31	8.31				
33	**Yadadri Bhuvanagiri**	3432.82	3247.38	94.60	185.44	5.40						
	Total	**105777.24**	**96504.46**	**91.23**	**8510.64**	**8.05**	**605.70**	**0.57**	**156.44**	**0.15**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
TRIPURA												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Dhalai**	995.81	995.81	100								
2	**North Tripura**	543.82	543.82	100								
3	**Khowai**	495.6	495.6	100								
4	**Gomati**	1098.28	1098.28	100								
5	**West Tripura**	782.82	782.82	100								
6	**Unakoti**	428.78	428.78	100								
7	**South Tripura**	981.03	981.03	100								
8	**Sepahijala**	871.7	871.7	100								
	Total	**6197.84**	**6197.84**	**100**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
UTTAR PRADESH												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	Lalitpur	3819.42			3819.42	100						
2	Saharanpur	3689.41	260.96	7.07	2067.9	56.05			1360.55	36.88		
3	Banda	4404.6	2159.49	49.03	2245.11	50.97						
4	Mathura	3360.78	2345.15	69.78			674.24	20.06	341.39	10.16		
5	Shamli	1361.26			234.4	17.22	503.29	36.97	623.57	45.81		
6	Chandauli	1884.69	1884.69	100								
7	Mirzapur	2954.37	2137.01	72.33	603.47	20.43	117.19	3.97	96.7	3.27		
8	Unnao	4602.34	4602.34	100								
9	Bagpat	1351.39			692.82	51.27			658.57	48.73		
10	Kanpur Dehat	3237.37	943.68	29.15	2293.69	70.85						
11	Chitrakoot	3006.65	1041.84	34.65	1410.8	46.92	554.01	18.43				
12	Shahjahanpur	4581.31	4581.31	100								
13	Pilibhit	3369.59	3369.59	100								
14	Jaunpur	3990.94	2522.77	63.21	1072.14	26.86	396.03	9.92				
15	Mahrajganj	2477.6	2477.6	100								
16	Ambedkar Nagar	2458.98	2158.67	87.79	300.31	12.21						
17	Maunath Bhanjan	1716.24	1716.24	100								
18	Kaushambi	1780.01	484.65	27.23	1015.97	57.08			279.39	15.7		
19	Raibareli	3924.58	3924.58	100								
20	Auraiya	2094.27	2094.27	100								
21	Etawah	2403.01	2403.01	100								
22	Mahoba	2293.41			1417.74	61.82			875.67	38.18		
23	Sitapur	5746.95	5746.95	100								
24	Hathras	1837.99	327.4	17.81	556.14	30.26	272.77	14.84	681.68	37.09		
25	Budaun	4237.88	1372.45	32.39	1854.39	43.76	489.02	11.54	522.02	12.32		
26	Bulandshahar	3609.47	152.46	4.22	1258.17	34.86	1002.49	27.77	1196.35	33.14		
27	Amethi	2329.92	2228.16	95.63	101.76	4.37						
28	Bareilly	4120	3244.34	78.75	742.83	18.03			132.83	3.22		
29	Gonda	3996.09	3996.09	100								
30	Jhansi	4619.37	2644.95	57.26	1974.42	42.74						
31	Aligarh	3808.43	1471.8	38.65	1932.29	50.74	246.37	6.47	157.97	4.15		
32	Bijnor	4589.03	2809.11	61.21	1398.84	30.48	381.08	8.3				
33	G.B.Nagar	1442.73			473.82	32.84	636.66	44.13	332.25	23.03		
34	Gorakhpur	3210.87	3210.87	100								
35	Kannauj	2143.46	996.35	46.48	468.08	21.84	305.17	14.24	373.86	17.44		
36	Etah	2427.57	869.07	35.8	1558.5	64.2						
37	Varanasi	1605.32	353.7	22.03	536.03	33.39	195.99	12.21	519.6	32.37		
38	Lucknow	2452.86	2142.76	87.36					310.1	12.64		
39	Firozabad	2419.53			891.92	36.86	202.61	8.37	1325	54.76		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
UTTAR PRADESH												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
40	**Azamgarh**	4171.19	4171.19	100								
41	**Deoria**	2538	2538	100								
42	**Balrampur**	3348.57	3348.57	100								
43	**Basti**	2938.07	2938.07	100								
44	**Ayodhya**	2522.01	2522.01	100								
45	**Agra**	3947.17			1427.26	36.16	279.46	7.08	2240.45	56.76		
46	**Hapur**	1144.81			238.01	20.79	560.55	48.96	346.25	30.25		
47	**Pratapgarh**	3717.43	976.01	26.25	1782.15	47.94	959.27	25.8				
48	**Bahraich**	4387.25	4387.25	100								
49	**Mainpuri**	2760.72	1944.47	70.43	605.9	21.95			210.35	7.62		
50	**Kushi Nagar**	2873.78	2873.78	100								
51	**Meerut**	2810.49	726.68	25.86	1457.45	51.86	381.47	13.57	244.89	8.71		
52	**Ghaziabad**	1169.14			228.16	19.52			940.98	80.48		
53	**Fatehpur**	4252.55	2270.83	53.4	1637.54	38.51			344.18	8.09		
54	**Kasganj**	1993.88	1342.45	67.33	651.43	32.67						
55	**Moradabad**	2249.44	317.95	14.13	1585.16	70.47	269.08	11.96	77.25	3.43		
56	**Barabanki**	3891.32	3891.32	100								
57	**Sambhal**	2415.2	304.73	12.62	868.27	35.95	1242.2	51.43				
58	**Sant Kabir Nagar**	1646.99	1646.99	100								
59	**Lakhimpur Kheri**	6555.05	6555.05	100								
60	**Sant Ravidas Nagar**	983.05			983.05	100						
61	**Shrawasti**	1857.82	1857.82	100								
62	**Amroha**	2149.03			1078.66	50.19	720.65	33.53	349.72	16.27		
63	**Kanpur Nagar**	3094.83	695.86	22.48	1905.53	61.57	493.44	15.94				
64	**Siddharth Nagar**	2895.03	2895.03	100								
65	**Ghazipur**	3300.52	3082.02	93.38	218.5	6.62						
66	**Sonbhadra**	2414.59	2231.52	92.42	183.07	7.58						
67	**Hamirpur**	3815.4	2718.29	71.25	1097.11	28.75						
68	**Ballia**	2927	2927	100								
69	**Farrukhabad**	2206.23	1063.82	48.22	1142.41	51.78						
70	**Hardoi**	5948.43	5948.43	100								
71	**Jalaun**	4565.83	4565.83	100								
72	**Muzaffarnagar**	2756.66	1469.32	53.3	468.39	16.99	580.22	21.05	238.73	8.66		
73	**Prayagraj**	4996.3	3144.72	62.94	1365.85	27.34	313.9	6.28	171.83	3.44		
74	**Rampur**	2297.9	522.51	22.74	1775.39	77.26						
75	**Sultanpur**	2653.81	2653.81	100								
	Total	**229555.18**	**151205.64**	**65.87**	**51620.24**	**22.49**	**11777.16**	**5.13**	**14952.13**	**6.51**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
UTTARAKHAND													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	
1	**Dehradun**	1255.44	1255.44	100									
2	**Haridwar**	1568.35	915.35	58.36	653	41.64							
3	**Nainital**	236.43	123.66	52.3	112.77	47.7							
4	**Udhamsingh Nagar**	1932.82	1747.65	90.42	185.17	9.58							
	Total	**4993.04**	**4042.1**	**80.95**	**950.94**	**19.05**							

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
WEST BENGAL												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Purba Barddhaman**	5432.69	4558.62	83.91	874.07	16.09						
2	**Murshidabad**	5133.38	4116.12	80.18	846.19	16.48	171.07	3.33				
3	**Jhargram**	3020.6	3020.6	100								
4	**North 24 Parganas**	3872.33	1403.61	36.25	887.89	22.93	650.63	16.8			930.2	24.02
5	**Koch Bihar**	3396.37	3396.37	100								
6	**Malda**	3238.86	3137.57	96.87	101.29	3.13						
7	**Paschim Barddhaman**	1591.65	1508.38	94.77	83.27	5.23						
8	**Kalimpong**	210.71	210.71	100								
9	**Alipurduar**	2375.97	2375.97	100								
10	**Uttar Dinajpur**	3192.83	3192.83	100								
11	**South 24 Parganas**	5513.01									5513.01	100
12	**Darjiling**	1084.72	1084.72	100								
13	**Hugli**	3003.71	2566.73	85.45	436.98	14.55						
14	**Puruliya**	6193.13	6193.13	100								
15	**Kolkatta**	187									187	100
16	**Haora**	1323.55	606.06	45.79							717.49	54.21
17	**Bankura**	6880.01	6880.01	100								
18	**Jalpaiguri**	3402.19	3402.19	100								
19	**Dakshin Dinajpur**	2240.36	1838.93	82.08	401.43	17.92						
20	**Nadia**	3797.89	405.12	10.67	1477.45	38.9	1915.32	50.43				
21	**Birbhum**	4548.09	4548.09	100								
22	**Purba Medinipur**	3809.95	1649.55	43.3							2160.4	56.7
23	**Paschim Medinipur**	6316.77	5538.83	87.68	777.94	12.32						
	Total	**79765.77**	**61634.14**	**77.27**	**5886.51**	**7.38**	**2737.02**	**3.43**			**9508.1**	**11.92**

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
ANDAMAN & NICOBAR ISLANDS													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	N & M Andaman	580.4	580.4	100								
2	Nicobar	1224.43	1224.43	100								
3	South Andaman	315.24	315.24	100								
	Total	**2120.07**	**2120.07**	**100**								

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
CHANDIGARH												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Chandigarh**	114			114	100						
	Total	**114**			**114**	**100**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
DADRA & NAGAR HAVELI													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Dadra Nagar Haveli**	416							416	100		
	Total	**416**							**416**	**100**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
DAMAN & DIU												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Daman**	70.9							70.9	100		
2	**Diu**	40							40	100		
	Total	**110.9**							**110.9**	**100**		

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
JAMMU & KASHMIR													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	
1	Bandipora	33.28	33.28	100									
2	Ganderbal	24	24	100									
3	Doda	22.45	22.45	100									
4	Anantnag	657.11	657.11	100									
5	Ramban	18.31	18.31	100									
6	Srinagar Urban	875			875	100							
7	Budgam	580	580	100									
8	Jammu	1652.11	1652.11	100									
9	Pulwama	575	575	100									
10	Reasi	70	70	100									
11	Samba	447.89	447.89	100									
12	Kathua	775	775	100									
13	Kishtwar	20	20	100									
14	Kulgam	144	144	100									
15	Kupwara	600	600	100									
16	Poonch	242.63	242.63	100									
17	Udhampur	218.47	218.47	100									
18	Rajouri	350	350	100									
19	Shopian	234	234	100									
20	Baramulla	1125	1125	100									
	Total	8664.25	7789.25	89.9	875	10.1							

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
LADAKH													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Leh**	714	383	53.64	331	46.36						
2	**Kargil**	249	249	100								
	Total	**963**	**632**	**65.63**	**331**	**34.37**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023													
LAKSHADWEEP													
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline		
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Lakshadweep**	26.21	19.87	75.81	6.34	24						
	Total	**26.21**	**19.87**	**75.81**	**6.34**	**24**						

DYNAMIC GROUND WATER RESOURCES OF INDIA, 2023												
PUDUCHERRY												
S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**Puducherry**	322	9	2.80	252.35	78.37			40.65	12.62	20.00	6.21
2	**Karaikal**	161	161	100								
	Total	**483**	**170**	**35.20**	**252.35**	**52.25**			**40.65**	**8.42**	**20.00**	**4.14**

Annexure - IV(A)

State-wise Categorization of Blocks/ Mandals/ Taluks in India (as in 2023)

CATEGORIZATION of ASSESSMENT UNITS, 2023							
ANDHRA PRADESH							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Ananthapuramu**	1	Narpala				
2	**Annamayya**	1	Chitvel				
		2	Chinnamandem				
3	**Chittoor**	1	Pedda Panjani				
		2	Rama Kuppam				
		3	Venkatagiri Kota				
		4	Thavanampalle				
		5	Gudi Palle				
		6	Nindra				
		7	Puthalapattu				
4	**East Godavari**	1	Nallajerla				
5	**Palnadu**			1	Bollapalle	1	Veldurthi
6	**Prakasam**	1	Pullalacheruvu			1	Racherla
		2	Giddaluru			2	Pedaaraveedu
						3	Cumbum
7	**Sri Sathya Sai**	1	Gudibanda	1	Agali	1	Tanakal
		2	Nallacheruvu			2	Hindupur
		3	Amadagur			3	Rolla
						4	Gandlapenta
8	**Srikakulam**	1	Gara	1	Laveru	1	Ranastalam
9	**Y.S.R Kadapa**	1	Vemula			1	Pulivendla

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
667	18	3	10

CATEGORIZATION of ASSESSMENT UNITS, 2023							
ASSAM							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	Kamrup (M) Urban	1	Kamrup (M) Urban				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
245	1	0	0

CATEGORIZATION of ASSESSMENT UNITS, 2023							
BIHAR							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Begusarai**	1	Navkothi				
		2	Birpur				
		3	Khudabandpur				
		4	Bachwara				
2	**Bhojpur**	1	Bihiya				
		2	Shahpur				
		3	Ara Sadar				
		4	Koilwar				
3	**Gaya**	1	Tekari				
		2	Belaganj				
		3	Khizar Sarai				
		4	Gaya Sadar				
4	**Jehanabad**	1	Ghoshi			1	Ratni Faridpur
		2	Modanganj			2	Kako
		3	Jehanabad				
5	**Kaimur**	1	Kudra				
6	**Muzaffarpur**	1	Gaighat	1	Minapur	1	Mushahari
		2	Kurhani				
		3	Bandra				
		4	Muraul (Dholi)				
		5	Bochahan				
		6	Sakra				
		7	Kanti				
7	**Nalanda**	1	Ekangarsarai	1	Giriyak	1	Nagarnausa
		2	Hilsa				
		3	Parwalpur				
		4	Asthawan				
		5	Chandi				
		6	Karai Parsarai				
		7	Rajgir				
		8	Harnaut				
		9	Sarmera				
		10	Bind				
8	**Nawada**	1	Hisua				
		2	Narhat				
		3	Meskaur				
		4	Akbarpur				
		5	Nardiganj				
9	**Patna**	1	Phulwari Sharif	1	Sampatchak	1	Patna Urban
		2	Masaurhi				
		3	Athmalgola				
		4	Dhanarua				
		5	Fatuha				
		6	Punpun				
10	**Rohtas**	1	Kochas				
		2	Dehri				
11	**Samastipur**	1	Ujiyarpur	1	Dalsingsarai	1	Tajpur
		2	Sarairanjan				
		3	Bibhutipur				
		4	Vidyapatinagar				
		5	Kalyanpur				
12	**Sheikhpura**			1	Barbigha		
13	**Vaishali**	1	Mahnar	1	Jandaha	1	Patepur
		2	Bidupur	2	Raja Pakar	2	Hajipur

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
535	**53**	**7**	**8**

CATEGORIZATION of ASSESSMENT UNITS, 2023							
CHHATISGARH							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Balod**	1	Balod	1	Gurur		
		2	Gunderdehi				
2	**Bemetara**	1	Saja	1	Nawagarh		
				2	Bemetara		
				3	Berla		
3	**Bilaspur**	1	Takhatpur				
		2	Belha				
4	**Dhamtari**	1	Dhamtari				
		2	Kurud				
5	**Durg**	1	Durg				
		2	Dhamdha				
6	**Gariaband**	1	Rajim/Fingeshwar				
7	**Kabirdham**	1	Pandariya				
8	**Kanker**	1	Charama				
9	**Khairagarh-Chhuikhad**	1	Khairagarh				
10	**Korba**	1	Katghora				
11	**Mahasamund**	1	Basna				
12	**Raigarh**	1	Tamnar				
		2	Pusaur				
13	**Raipur**			1	Dharsiwa		
14	**Rajnandgaon**	1	Rajnandgaon				
		2	Dongargaon				
		3	Dongargarh				
15	**Sarangarh-Bilairagh**	1	Baramkela				
16	**Surajpur**	1	Surajpur				

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
146	**22**	**5**	**0**

CATEGORIZATION of ASSESSMENT UNITS, 2023							
DELHI							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Central**			1	Kotwali	1	Karol Bagh
2	**East**			1	Gandhi Nagar		
				2	Mayur Vihar		
				3	Preet Vihar		
3	**New Delhi**					1	Delhi Cantonment
						2	Chanakyapuri
						3	Vasant Vihar
4	**North**	1	Alipur	1	Model Town	1	Narela
5	**North East**	1	Seelampur			1	Yamuna Vihar
						2	Karawal Nagar
6	**North West**	1	Saraswati Vihar				
7	**Shahdara**			1	Seemapuri	1	Vivek Vihar
						2	Shahdara
8	**South**			1	Hauz Khas	1	Mehrauli
						2	Saket
9	**South East**			1	Kalkaji		
				2	Defence Colony		
				3	Sarita Vihar		
10	**South West**			1	Dwarka	1	Kapashera
11	**West**	1	Punjabi Bagh	1	Patel Nagar	1	Rajouri Garden

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
34	4	12	13

CATEGORIZATION of ASSESSMENT UNITS, 2023							
GUJARAT							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Ahmedabad**	1	Bavla	1	Mandal	1	Ahmedabad City & Das
				2	Ahmedabad Urban		
2	**Amreli**	1	Rajula				
3	**Banaskantha**	1	Palanpur			1	Dantiwada
						2	Dhanera
						3	Kankrej
						4	Lakhani
						5	Vadgam
						6	Deodar
						7	Deesa
						8	Tharad
4	**Gandhinagar**	1	Kalol			1	Gandhinagar
		2	Mansa			2	Dehgam
5	**Kachchh**			1	Mandvi	1	Bhachau
						2	Bhuj
6	**Mahesana**	1	Unjha	1	Mahesana	1	Vadnagar
		2	Kadi			2	Kheralu
		3	Visnagar			3	Becharaji
						4	Vijapur
						5	Jotana
						6	Satlasana
7	**Narmada**	1	Nandod				
8	**Patan**	1	Patan	1	Sidhpur	1	Sarsvati(Patan)
						2	Chanasma
9	**Rajkot**	1	Dhoraji	1	Jasdan		
		2	Upleta				
		3	Paddhari				
		4	Vinchchiya				
10	**Sabarkantha**	1	Vadali			1	Prantij
		2	Idar				
		3	Himatnagar				
11	**Surat**					1	Surat Urban
12	**Surendranagar**	1	Chuda				
13	**Vadodara**	1	Desar	1	Padra		
		2	Sinor	2	Vadodara		

ABSTRACT			
Total No. of Assessed Units	**Number of Semicritical Assessment Units**	**Number of Critical Assessment Units**	**Number of Over Exploited Assessment Units**
252	**20**	**8**	**23**

CATEGORIZATION of ASSESSMENT UNITS, 2023							
HARYANA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Ambala**	1	Ambala-II	1	Ambala-I	1	Barara
		2	Shahzadpur			2	Naraingarh
						3	Saha
2	**Bhiwani**					1	Loharu
						2	Kairu
						3	Tosham
						4	Behal
3	**Charkhi Dadri**					1	Jhojhu
						2	Badhra
4	**Faridabad**					1	Faridabad
						2	Tigaon
						3	Faridabad Urban
						4	Ballabgarh
5	**Fatehabad**			1	Bhattu Kalan	1	Fatehabad
				2	Bhuna	2	Ratia
						3	Nagpur
						4	Tohana
						5	Jakhal
6	**Gurgaon**					1	Farrukh Nagar
						2	Gurgaon
						3	Pataudi
						4	Sohna
						5	Gurgaon Urban
7	**Hisar**	1	Barwala	1	Agroha	1	Narnaund
8	**Jind**	1	Pillukhera			1	Safidon
						2	Jind
						3	Uchana
						4	Ujhana
						5	Alewa
9	**Kaithal**					1	Pundri
						2	Dhand
						3	Kalayat
						4	Guhla
						5	Kaithal
						6	Rajound
						7	Siwan
10	**Karnal**			1	Indri	1	Nissing At Chirao
						2	Nilokheri
						3	Karnal
						4	Munak
						5	Kunjpura
						6	Assandh
						7	Gharaunda (Part)
11	**Kurukshetra**					1	Thanesar
						2	Babain
						3	Ladwa
						4	Ismailabad
						5	Pipli
						6	Shahbad
						7	Pehowa
12	**Mahendragarh**			1	Satnali	1	Kanina
				2	Nizampur	2	Nangal Chaudhry
						3	Sihma
						4	Mahendragarh
						5	Narnaul
						6	Ateli Nangal

CATEGORIZATION of ASSESSMENT UNITS, 2023							
HARYANA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
13	**Mewat**	1	Indri	1	Punahana	1	Taoru
						2	Ferozepur Jhirka
14	**Palwal**	1	Hodal	1	Hassanpur	1	Prithla
						2	Badoli
15	**Panchkula**			1	Raipur Rani		
16	**Panipat**					1	Israna
						2	Bapoli
						3	Sanauli Khurd
						4	Madlauda
						5	Panipat
						6	Samalkha
17	**Rewari**			1	Dahina	1	Rewari
						2	Dharuhera
						3	Bawal
						4	Nahar
						5	Jatusana
						6	Khol At Rewari
18	**Sirsa**	1	Baragudha			1	Odhan
						2	Nathusari Chopta
						3	Rania
						4	Sirsa
						5	Ellenabad
						6	Dabwali
19	**Sonipat**					1	Rai
						2	Sonipat
						3	Ganaur
						4	Mundlana
						5	Murthal
20	**Yamuna Nagar**	1	Khizrabad			1	Jagadhri
		2	Chhachhrauli			2	Sadaura (Part)
						3	Bilaspur
						4	Radaur
						5	Mustafabad

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Unit	Number of Critical Assessment Unit	Number of Over Exploited Assessment Unit
143	**9**	**11**	**88**

CATEGORIZATION of ASSESSMENT UNITS, 2023							
JHARKHAND							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Bokaro**					1	Bermo
2	**Deoghar**	1	Karon				
		2	Sarwan				
		3	Sonaraithadhi				
3	**Dhanbad**	1	Gobindpur	1	Topchanchi	1	Baliapur
		2	Dhanbad	2	Dhanbad Urban		
4	**East Singhbhum**					1	Golmuri Cum Jugsalai
						2	Jamshedpur Urban
5	**Garhwa**	1	Bhawanathpur				
6	**Giridih**	1	Giridih				
7	**Hazaribagh**	1	Daru				
8	**Koderma**	1	Koderma	1	Jainagar		
9	**Ramgarh**			1	Ramgarh	1	Chitarpur
10	**Ranchi**	1	Khelari	1	Silli		
		2	Ormanjhi	2	Ranchi Urban		

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
263	11	6	5

CATEGORIZATION of ASSESSMENT UNITS, 2023							
KARNATAKA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Bagalkot**	1	Guledagudda	1	Badami	1	Bagalkote
		2	Mudhol				
		3	Hungund				
		4	Ilkal				
		5	Rabakavi Banahatti				
2	**Belagavi**	1	Athani	1	Kagavada	1	Bailhongal
		2	Yaragatti	2	Savadatti		
		3	Chikkodi				
		4	Gokak				
		5	Hukkeri				
3	**Bengaluru (Rural)**					1	Nelamangala
						2	Doddaballapura
						3	Devanahalli
						4	Hoskote
4	**Bengaluru (Urban)**					1	Bangalore City
						2	Anekal
						3	Yelahanka
						4	Bangalore-East
						5	Bangalore (North)
						6	Bangalore-South
5	**Bidar**	1	Bhalki				
		2	Hulasuru				
6	**Chamarajanagara**	1	Kollegala	1	Chamarajanagara	1	Gundlupet
		2	Kollegala(Hanur)				
		3	Yalandur				
7	**Chikkaballapura**					1	Shidlagatta
						2	Chinthamani
						3	Bagepalli
						4	Chikballapur
						5	Gudibande
						6	Gauribidanur
8	**Chikkamagaluru**					1	Ajjampura
						2	Kadur
9	**Chitradurga**					1	Challakere
						2	Hosadurga
						3	Chitradurga
						4	Holalkere
						5	Hiriyur
10	**Davanagere**			1	Davanagere	1	Channagiri
						2	Jagaluru
11	**Gadag**	1	Gadag	1	Rona	1	Gajendragad
		2	Mundargi				
12	**Hassan**			1	Channarayapatna	1	Arsikere
13	**Haveri**	1	Hirekerur				
		2	Byadagi				
		3	Ratteehalli				
14	**Kalburgi**	1	Afzalpur				

CATEGORIZATION of ASSESSMENT UNITS, 2023							
KARNATAKA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
15	**Kolara**					1	Kolar
						2	K.G.F
						3	Malur
						4	Srinivaspura
						5	Bangarpet
						6	Mulabagilu
16	**Koppal**	1	Yelburga	1	Kukanuru		
		2	Kanakagiri				
17	**Mandya**	1	Malavalli				
18	**Raichur**	1	Sirivara				
19	**Ramanagara**	1	Channapatna	1	Magadi	1	Harohalli
		2	Kanakpura	2	Ramanagar		
20	**Tumakuru**	1	Pavagada	1	Koratagere	1	Madhugiri
						2	Sira
						3	Chiknayakanahalli
						4	Tiptur
						5	Tumkur
21	**Vijayanagara**	1	Hadagali	1	Harapanahalli	1	Hagaribommanahalli
						2	Kotturu
22	**Vijayapura**	1	Nidagundi				
23	**Yadgir**	1	Gurumithakala				
		2	Yadgir				

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
234	32	12	44

CATEGORIZATION of ASSESSMENT UNITS, 2023							
KERALA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Idukki**	1	Kattappana				
		2	Nedumkandam				
2	**Kannur**	1	Thalassery				
		2	Kannur				
		3	Panur				
3	**Kasargod**	1	Manjeswar	1	Kasaragod		
4	**Kollam**	1	Mukhathala				
		2	Sasthamkotta				
5	**Kozhikkode**	1	Kozhikode				
		2	Kunnamangalam				
		3	Ballussery				
6	**Malappuram**	1	Kondotty				
		2	Mankada				
		3	Malappuram				
		4	Tirur				
		5	Thriurangadi				
		6	Kuttippuram				
		7	Thanur				
		8	Vengara				
7	**Palakkad**	1	Pattambi	1	Chittur		
		2	Thrithala	2	Malampuzha		
8	**Thiruvananthapuram**	1	Varkala				
		2	Nedumangad				
		3	Athiyannur				
		4	Pothencode				
		5	Parassala				
		6	Chirayinkil				
9	**Thrissur**	1	Chowannur				
		2	Mathilakom				
		3	Thalikkulam				

ABSTRACT			
Total No. of Assessed Units	**Number of Semicritical Assessment Units**	**Number of Critical Assessment Units**	**Number of Over Exploited Assessment Units**
152	**30**	**3**	**0**

CATEGORIZATION of ASSESSMENT UNITS, 2023							
MADHYA PRADESH							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Agar Malwa**	1	Badod			1	Nalkheda
						2	Susner
2	**Anuppur**	1	Kotma				
3	**Ashoknagar**	1	Isagarh				
		2	Chanderi				
4	**Barwani**	1	Rajpur			1	Pansemal
5	**Betul**	1	Betul				
		2	Multai				
6	**Bhopal**	1	Berasia				
		2	Bhopal Urban				
		3	Phanda				
7	**Burhanpur**	1	Burhanpur				
8	**Chhatarpur**	1	Buxwaha				
		2	Chhatarpur				
		3	Bijawar				
		4	Nowgaon				
9	**Chhindwara**	1	Mohkheda	1	Chhindwara		
		2	Pandhurna				
10	**Damoh**	1	Patharia				
11	**Dewas**	1	Khategaon			1	Sonkutch
						2	Dewas
12	**Dhar**			1	Tirla	1	Nalchha
						2	Dhar
						3	Badnawar
13	**Gwalior**	1	Gwalior Urban				
14	**Hoshangabad**	1	Bankhedi				
15	**Indore**	1	Mhow	1	Indore Urban	1	Depalpur
						2	Indore
						3	Sawer
16	**Jabalpur**	1	Jabalpur Urban				
17	**Jhabua**	1	Jhabua				
18	**Khandwa**	1	Chhegaon Makhan				
19	**Khargone**	1	Khargone				
20	**Mandsaur**	1	Malhargarh			1	Mandsaur
		2	Bhanpura			2	Sitamau
		3	Garoth				

CATEGORIZATION of ASSESSMENT UNITS, 2023							
MADHYA PRADESH							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
21	**Narsinghpur**	1	Narsinghpur				
22	**Neemuch**	1	Manasa			1	Neemuch
						2	Jawad
23	**Niwari**	1	Niwari				
24	**Raisen**	1	Obedullaganj				
25	**Rajgarh**	1	Rajgarh	1	Narsinghgarh	1	Sarangpur
		2	Biaora				
		3	Jirapur				
		4	Khilchipur				
26	**Ratlam**	1	Sailana			1	Alot
		2	Bajna			2	Ratlam
						3	Piploda
						4	Jaora
27	**Rewa**	1	Mauganj				
28	**Satna**	1	Rampur-Baghelan				
		2	Maiihar				
		3	Amarpatan				
		4	Sohawal				
29	**Sehore**			1	Ashta		
30	**Shajapur**	1	Shajapur			1	Kalapipal
						2	Moman Badodiya
						3	Shujalpur
31	**Sheopur**	1	Vijaypur				
32	**Shivpuri**	1	Badarwas				
		2	Kolaras				
		3	Pichhore				
		4	Khaniyadhana				
		5	Narwar				
33	**Tikamgarh**	1	Palera				
		2	Baldeogarh				
		3	Jatara				
		4	Tikamgarh				
34	**Ujjain**	1	Tarana			1	Ghatia
		2	Mahidpur			2	Badnagar
		3	Khchrod			3	Ujjain
35	**Vidisha**	1	Gyaraspur				
		2	Kurwai				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
317	60	5	26

CATEGORIZATION of ASSESSMENT UNITS, 2023							
MAHARASHTRA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Ahmednagar**	1	Akola	1	Sangamner	1	Rhata
		2	Newasa	2	Kopargaon		
		3	Shevgaon	3	Shrirampur		
		4	Shrigonda	4	Rahuri		
		5	Pathardi				
2	**Akola**	1	Barsi Takli				
3	**Amravati**	1	Amravati	1	Achlapur	1	Chandur Bazar
		2	Dhamangaon Railway			2	Warud
		3	Nandgaon			3	Morshi
4	**Aurangabad**	1	Gangapur				
		2	Fulambre				
		3	Aurangabad				
		4	Paithan				
		5	Vaijapur				
		6	Sillod				
		7	Khuldabad				
5	**Buldhana**	1	Nandura			1	Jalgaon
		2	Buldhana			2	Sangrampur
		3	Chikhali				
		4	Malakapur				
		5	Deulgaon Raja				
		6	Motala				
		7	Sindkhedraja				
6	**Jalgaon**	1	Bhadgaon			1	Yawal
		2	Pachora			2	Raver
		3	Chalisgaon				
		4	Amalner				
		5	Parola				
		6	Bodwad				
		7	Bhusawal				
		8	Chopda				
		9	Muktainagar				
		10	Jamner				
7	**Latur**	1	Latur				
8	**Nagpur**	1	Katol				
9	**Nashik**	1	Baglan Satana	1	Niphad		
		2	Chandwad	2	Deola		
		3	Yeola	3	Sinnar		
10	**Osmanabad**	1	Osmanabad				
		2	Kalamb				
11	**Pune**	1	Khed	1	Shirur		
		2	Indapur				
		3	Purandhar				
		4	Ambegaon				
		5	Junnar				
		6	Baramati				
		7	Daund				
12	**Sangli**	1	Kavathe Mahankal				
13	**Satara**	1	Khatav				
		2	Man				
14	**Solapur**	1	Madha			1	Malshiras
		2	Mangalwedha				
		3	Barshi				
		4	Sangola				
		5	Pandharpur				
		6	Karmala				
		7	Mohol				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
353	57	9	9

CATEGORIZATION of ASSESSMENT UNITS, 2023							
ODISHA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Angul**	1	Talcher				
2	**Balasore**	1	Baliapal				
3	**Jajpur**	1	Korei				
4	**Jharsuguda**	1	Jharsuguda				
5	**Khurda**	1	Bologarh				
		2	Khurda				
		3	Bhubaneswar				
6	**Nayagarh**	1	Nayagarh				
7	**Nuapada**	1	Nuapada				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
314	9	0	0

CATEGORIZATION of ASSESSMENT UNITS, 2023							
PUNJAB							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Amritsar**					1	Tarsikka
						2	Attari
						3	Rayya
						4	Majitha
						5	Chogawan
						6	Jandiala Guru
						7	Verka
						8	Amritsar Urban
						9	Harsha Chhina
						10	Ajnala
2	**Barnala**					1	Sehna
						2	Barnala
						3	Mahal Kalan
3	**Bathinda**	1	Rampura	1	Bathinda	1	Goniana Mandi
						2	Maur
						3	Nathana
						4	Phul
						5	Bhagta Bhai Ka
4	**Faridkot**					1	Kot Kapura
						2	Faridkot
						3	Jaiton
5	**Fatehgarh Sahib**					1	Khamanon
						2	Sirhind
						3	Amloh
						4	Khera
						5	Bassi Pathanan
6	**Fazilka**	1	Arniwala Sheikh Subanpur			1	Jalalabad
7	**Firozpur**	1	Guruhar Sahai			1	Mamdot
		2	Makhu			2	Firozpur
						3	Zira
						4	Ghall Khurd
8	**Gurdaspur**	1	Dorangala			1	Kahnuwan
						2	Kalanaur
						3	Sri Hargobindpur
						4	Dhariwal
						5	Fatehgarh Churian
						6	Gurdaspur
						7	Batala
						8	Dera Baba Nanak
						9	Qadian
9	**Hoshiarpur**	1	Bhunga			1	Garh Shankar
		2	Hajipur			2	Hoshiarpur-1
		3	Hoshiarpur-2			3	Dasuya
						4	Mahilpur
						5	Tanda
						6	Mukerian
10	**Jalandhar**					1	Lohian
						2	Nur Mahal
						3	Bhogpur
						4	Jalandhar East
						5	Jalandhar West
						6	Rurka Kalan
						7	Jalandhar City
						8	Phillaur
						9	Nakodar
						10	Mehatpur
						11	Adampur
						12	Shahkot
11	**Kapurthala**					1	Phagwara
						2	Dhilwan
						3	Kapurthala
						4	Nadala
						5	Sultanpur Lodhi
12	**Ludhiana**					1	Raikot
						2	Pakhowal
						3	Dehlon
						4	Samrala
						5	Machhiwara
						6	Ludhiana-2
						7	Jagraon
						8	Sudhar
						9	Ludhiana-1
						10	Sidhwan Bet
						11	Maloud
						12	Khanna
						13	Ludhiana City
						14	Doraha
13	**Malerkotla**					1	Malerkotla-1
						2	Malerkotla-2

CATEGORIZATION of ASSESSMENT UNITS, 2023							
PUNJAB							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
14	**Mansa**	1	Budhlada			1	Bhikhi
						2	Mansa
15	**Moga**					1	Nihal Singh Wala
						2	Moga-1
						3	Kot Ise Khan At Dharamkot
						4	Moga-2
						5	Bagha Purana
16	**Pathankot**	1	Narot Jaimal Singh				
		2	Bamial				
17	**Patiala**					1	Nabha
						2	Ghanaur
						3	Patiala
						4	Shambu Kalan
						5	Sanaur
						6	Rajpura
						7	Patran
						8	Bhunarheri
						9	Samana
18	**Rupnagar**	1	Anandpur Sahib			1	Morinda
						2	Chamkaur Sahib
19	**SAS Nagar**	1	Majri	1	Kharar	1	Derabassi
20	**SBS Nagar**			1	Balachaur	1	Aur
						2	Banga
						3	Nawan Shahr
21	**Sangrur**					1	Sangrur
						2	Lehra Gaga
						3	Andana
						4	Bhawanigarh
						5	Dhuri
						6	Dirba
						7	Sunam
						8	Sher Pur
22	**Tarn Taran**					1	Tarn Taran
						2	Gandiwind Tatla
						3	Naushera Pannuan
						4	Chohla Sahib
						5	Khadur Sahib
						6	Valtoha
						7	Bhikhiwind
						8	Patti

ABSTRACT			
Total No. of Assessed Units	**Number of Semicritical Assessment Unit**	**Number of Critical Assessment Unit**	**Number of Over Exploited Assessment Unit**
153	**13**	**3**	**117**

CATEGORIZATION of ASSESSMENT UNITS, 2023							
RAJASTHAN							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Ajmer**					1	Ajmer Urban
						2	Masooda
						3	Sarwar
						4	Kekri
						5	Shrinagar Rural
						6	Kishangarh
						7	Arain
						8	Jawaja
						9	Peesangan Rural
						10	Bhinay
2	**Alwar**					1	Rajgarh
						2	Tijara
						3	Kathumar
						4	Mandawar
						5	Umren
						6	Bansur
						7	Behror
						8	Laxmangarh
						9	Neemrana
						10	Kishangarh Bas
						11	Kotkasim
						12	Ramgarh
						13	Reni
						14	Thanagazi
3	**Banswara**	1	Anandpuri				
		2	Gangar Talai				
		3	Garhi				
		4	Kushalgarh				
		5	Bagidora				
4	**Baran**	1	Antah	1	Shahbad	1	Baran
				2	Kishanganj	2	Chhipabarod
						3	Chhabra
						4	Atru
5	**Barmer**	1	Patodi			1	Sheo
		2	Kalyanpur			2	Barmer
						3	Gadraroad
						4	Gudhamalani
						5	Samdari
						6	Dhanaoo
						7	Serwa
						8	Baytoo
						9	Siwana
						10	Dhorimanna
						11	Gira
						12	Balotra
						13	Sindhari
						14	Ramsar
6	**Bharatpur**					1	Rupbas
						2	Nadbai
						3	Kaman
						4	Sewar
						5	Deeg
						6	Kumher
						7	Nagar
						8	Pahari
						9	Weir
						10	Bayana
7	**Bhilwara**					1	Banera
						2	Hurda
						3	Bijoliyan
						4	Kotri
						5	Suwana
						6	Asind
						7	Shahpura
						8	Raipur
						9	Mandal
						10	Jahazpur
						11	Mandalgarh
						12	Sahara
8	**Bikaner**	1	Panchoo			1	Dungargarh
						2	Nokha
						3	Bikaner Rural

CATEGORIZATION of ASSESSMENT UNITS, 2023							
RAJASTHAN							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
9	**Bundi**	1	Keshorai Patan			1	Bundi
						2	Nainwa
						3	Hindoli
10	**Chittaurgarh**					1	Bhainsrorgarh
						2	Bhopalsagar
						3	Bhadesar
						4	Gangrar
						5	Begun
						6	Kapasan
						7	Nimbahera
						8	Bari Sadri
						9	Chittaurgarh
						10	Rashmi
						11	Dungla
11	**Churu**					1	Churu
						2	Bidasar
						3	Sujangarh
						4	Rajgarh
						5	Ratangarh
12	**Dausa**					1	Sikrai
						2	Lalsot
						3	Lawan
						4	Bandikui
						5	Dausa
						6	Mahwa
13	**Dhaulpur**					1	Saipu
						2	Bari
						3	Rajakhera
						4	Baseri
						5	Dhaulpur
14	**Dungarpur**	1	Sagwara				
		2	Dovra				
15	**Hanumangarh**	1	Pilibanga				
16	**Jaipur**					1	Phagi
						2	Jalsoo
						3	Govindgarh
						4	Sanganer Rural
						5	Jhotwara Rural
						6	Kotputli
						7	Amber Rural
						8	Bassi
						9	Jamwa Ramgarh
						10	Sambhar
						11	Chaksu
						12	Viratnagar
						13	Shahpura
						14	Dudu
						15	Jaipur Urban
						16	Paota
17	**Jaisalmer**					1	Sankra
						2	Jaisalmer Urban
						3	Sam
						4	Jaisalmer Rural
18	**Jalor**			1	Chitalwana	1	Sanchore
						2	Sayla
						3	Bhinmal
						4	Raniwara
						5	Ahore
						6	Jaswantpura
						7	Jalore
19	**Jhalawar**			1	Aklera	1	Manohar Thana
				2	Bhawani Mandi	2	Jhalrapatan
						3	Khanpur
						4	Dag
						5	Bakani

CATEGORIZATION of ASSESSMENT UNITS, 2023							
RAJASTHAN							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
20	**Jhunjhunu**					1	Udaipurwati
						2	Surajgarh
						3	Chirawa
						4	Khetri
						5	Jhunjhunun
						6	Alsisar
						7	Buhana
						8	Nawalgarh
21	**Jodhpur**	1	Luni	1	Bap	1	Shekhala
						2	Tiwari
						3	Balesar
						4	Phalodi
						5	Jodhpur Urban
						6	Shergarh
						7	Dechoo
						8	Osian
						9	Bapini
						10	Bhopalgarh
						11	Lohawat
						12	Mandor Rural
						13	Baori
						14	Bilara
						15	Pipar City
22	**Karauli**	1	Nadoti			1	Mandrail
						2	Sapotra
						3	Todabhim
						4	Karauli
						5	Hindaun
23	**Kota**	1	Itawa			1	Khairabad
		2	Sultanpur			2	Sangod
						3	Kota Urban
						4	Ladpura Rural
24	**Nagaur**			1	Makrana	1	Ladnu
						2	Kheenvsar
						3	Molasar
						4	Degana
						5	Didwana
						6	Riyan Bari
						7	Merta
						8	Jayal
						9	Nawa
						10	Parbatsar
						11	Nagaur
						12	Kuchaman City
						13	Mundwa

CATEGORIZATION of ASSESSMENT UNITS, 2023							
RAJASTHAN							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
25	**Pali**	1	Pali			1	Rani Station
						2	Sumerpur
						3	Bali
						4	Raipur
						5	Sojat
						6	Kharchi (Marwar Junction)
						7	Desuri
						8	Jaitaran
26	**Pratapgarh**			1	Dhariawad	1	Pratapgarh
						2	Chhoti Sadri
						3	Arnod
27	**Rajsamand**			1	Khamnor	1	Deogarh
				2	Kumbhalgarh	2	Railmagra
						3	Bhim
						4	Rajsamand
						5	Amet
28	**Sawai Madhopur**					1	Gangapur
						2	Sawai Madhopur
						3	Chauth Ka Barwara
						4	Khandar
						5	Bonli
						6	Bamanwas
29	**Sikar**	1	Fatehpur			1	Neem Ka Thana
						2	Dhond
						3	Khandela
						4	Srimadhopur
						5	Lachhmangarh
						6	Patan
						7	Piprali
						8	Danta Ramgarh
30	**Sirohi**	1	Pindwara	1	Sirohi	1	Abu Road
						2	Reodar
						3	Sheoganj
31	**Tonk**	1	Deoli	1	Tonk	1	Uniara
						2	Malpura
						3	Niwai
32	**Udaipur**	1	Jhalara	1	Girwa Rural	1	Kotra
				2	Bhindar	2	Mavli
				3	Phalasiya	3	Kherwara
				4	Salumbar	4	Rishabhdev
				5	Udaipur Urban	5	Bargaon
				6	Gogunda	6	Lasadiya
				7	Kurawar		
				8	Semari		
				9	Jhadol		
				10	Sarada		
				11	Sayra		

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
302	22	23	216

CATEGORIZATION of ASSESSMENT UNITS, 2023

TAMIL NADU

S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Ariyalur**	1	Andimadam				
2	**Chengalpattu**	1	Chengalpattu				
		2	Thirukkalukundram				
		3	Madhurantakam				
3	**Chennai**	1	Alandur			1	Perambur
						2	Guindy
						3	Ambattur
						4	Velacheri
						5	Purasaivakkam
						6	Thiruvottiyur
						7	Egmore
						8	Tondiarpet
						9	Mambalam
						10	Mylapore
						11	Aminjikarai
						12	Ayanavaram
						13	Maduravoyal
4	**Coimbatore**	1	Madukarai	1	Pollachi	1	Annur
				2	Sulur	2	Coimbatore North
						3	Coimbatore South
						4	Kinathukadavu
						5	Mettupalayam
						6	Perur
						7	Valparai
5	**Cuddalore**			1	Cuddalore	1	Vridhachalam
				2	Veppur	2	Titagudi
						3	Panrutti
6	**Dharmapuri**	1	Dharmapuri	1	Pennagaram	1	Pappireddipatti
						2	Karimangalam
						3	Palacode
						4	Nallampalli
7	**Dindigul**			1	Palani	1	Dindigul West
						2	Athoor
						3	Dindigul East
						4	Gujiliamparai
						5	Nilakottai
						6	Oddenchatram
						7	Vedasandur
8	**Erode**	1	Erode	1	Anthiyur	1	Sathyamangalam
		2	Modakurichi			2	Nambiyur
		3	Kodumudi			3	Perundurai
		4	Thalavadi				
9	**Kallakurichchi**	1	Ulundurpet	1	Chinna Selam		
				2	Kallakurichchi		
10	**Kancheepuram**	1	Uthiramerur				
11	**Karur**	1	Kulithalai	1	Krishnarayapuram	1	Manmangalam
				2	Aravakurichi	2	Kadavur
						3	Karur
						4	Pugalur
12	**Krishnagiri**	1	Hosur	1	Pochampalli	1	Uthangarai
				2	Bargur	2	Krishnagiri
13	**Madurai**	1	Peraiyur	1	Madurai West		
		2	Tirumangalam				
		3	Usilampatti				
14	**Mayiladuthurai**					1	Mayiladuthurai
						2	Tharangambadi
						3	Kuthalam
						4	Sirkazhi
15	**Namakkal**	1	Kumarapalayam			1	Mohanur
						2	Namakkal
						3	Paramathi Velur
						4	Rasipuram
						5	Sendamangalam
						6	Tiruchengode
16	**Perambalur**					1	Alathur
						2	Perambalur
						3	Veppanthattai
17	**Pudukkottai**	1	Pudukkottai				
		2	Viralimalai				
		3	Ponnamaravathi				

CATEGORIZATION of ASSESSMENT UNITS, 2023

TAMIL NADU

S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
18	**Ranipet**	1	Arakkonam	1	Walajapet	1	Arcot
		2	Kalavai				
		3	Nemili				
		4	Sholingur				
19	**Salem**			1	Omalur	1	Valapady
						2	Attur
						3	Kadayampatti
						4	Salem South
						5	Edappady
						6	Gangavalli
						7	Mettur
						8	Peddanayakkanpalayam
						9	Salem
						10	Salem West
						11	Sankari
						12	Thalaivasal
20	**Tenkasi**	1	Alangulam			1	Sankarankovil
		2	Kadayanallur			2	Thiruvengadam
		3	Virakeralampudur				
21	**Thanjavur**	1	Budalur	1	Orathanadu	1	Thiruvaiyaru
				2	Thanjavur	2	Kumbakonam
				3	Peravurani	3	Papanasam
				4	Pattukkottai	4	Thiruvidaimarudhur
22	**Theni**	1	Periyakulam	1	Aundipatti		
		2	Uthamapalayam				
23	**Thiruvarur**					1	Valangaiman
						2	Kudavasal
						3	Nannilam
24	**Thoothukudi**	1	Sattankulam				
25	**Tiruchirappalli**	1	Mannachanallur			1	Manapparai
						2	Marungapuri
						3	Musiri
						4	Thuraiyur
26	**Tirunelveli**	1	Manur			1	Ambur
		2	Tisaiyanvilai			2	Tirupattur
						3	Vaniyambadi
						4	Natrampalli
27	**Tiruppur**	1	Tiruppur North	1	Avinashi	1	Uthukkuli
		2	Dharapuram	2	Kangeyam	2	Palladam
		3	Madathukkulam			3	Tiruppur South
		4	Udumalpet				
28	**Tiruvallur**	1	Avadi				
		2	Rk Pettai				
29	**Tiruvannamalai**	1	Tiruvannamalai	1	Kilpennathur	1	Chengam
		2	Arni	2	Vandavasi	2	Thandrampet
		3	Chetpet				
		4	Jamunamarathur				
		5	Kalasapakkam				
		6	Polur				
30	**Vellore**	1	Katpadi			1	Anaikkattu
						2	Gudiyattam
						3	K V Kuppam
						4	Pernambut
						5	Vellore
31	**Villupuram**	1	Villupuram	1	Marakkanam	1	Tiruvennainallur
		2	Vanur			2	Gingee
						3	Melmalaiyanaur
						4	Vikkiravandi
32	**Virudhunagar**	1	Srivlliputhur	1	Vembakottai		
		2	Rajapalayam				
		3	Sivakasi				
		4	Varattirayiruppu				
		5	Virudhunagar				

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Unit	Number of Critical Assessment Unit	Number of Over Exploited Assessment Unit
313	56	27	100

Note:- In Tamil Nadu State the Ground Water Resources are assessed Firka wise and for the 2023 Ground Water Resource Assessment, 1202 Firkas were assessed. For Uniformity in National Report the groundwater resources of the Firkas falling in a Taluka have been added to calculate the groundwater resources for the respective Talukas

CATEGORIZATION of ASSESSMENT UNITS, 2023							
TELANGANA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Adilabad**			1	Mavala	1	Adilabad Urban
2	**Bhadradri Kothagudem**	1	Sujathanagar				
		2	Chunchupally				
		3	Dammapeta				
3	**Hanumakonda**	1	Velair	1	Bheemadevarapalle		
		2	Dharmasagar				
		3	Inole				
		4	Khazipet				
4	**Hyderabad**	1	Tirumalgiri	1	Amberpet	1	Charminar
		2	Bandlaguda	2	Maredpally	2	Golkonda
		3	Bahadurpura	3	Nampally	3	Asifnagar
		4	Musheerabad	4	Khairatabad	4	Saidabad
				5	Shaikpet	5	Ammerpet
				6	Secunderabad	6	Himayatnagar
5	**Jagtial**	1	Bheemaram				
		2	Kathlapur				
6	**Jangaon**	1	Jangaon				
7	**Jogulamba Gadwal**	1	Kaloor Timmanadoddi				
8	**Kamareddy**	1	Kamareddy				
		2	Bibipet				
		3	Palvancha				
		4	Domakonda				
9	**Karimnagar**	1	Ramadugu				
10	**Khammam**	1	Raghunadhapalem				
11	**Mahabubabad**	1	Danthalapalle				
12	**Mahabubnagar**	1	Hanwada				
		2	Balanagar				
13	**Medak**	1	Tupran				
		2	Manoharabad				
		3	Narsapur				
14	**Medchal Malkajgiri**	1	Kukatpally			1	Balanagar
		2	Muduchinthalapally			2	Quthbullapur
						3	Bachpalle
15	**Nagarkurnool**	1	Veldanda				
16	**Nalgonda**	1	Nalgonda				
		2	Chityala				
		3	Munugode				
		4	Marriguda				
		5	Chandur				
		6	Chinthapalle				
		7	Nampalle				

CATEGORIZATION of ASSESSMENT UNITS, 2023							
TELANGANA							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
17	**Nizamabad**	1	Sirkonda			1	Nizamabad South
		2	Aloor				
		3	Rudrur				
		4	Jakranpalle				
		5	Bheemgal				
		6	Armur				
18	**Rajanna Siricilla**	1	Konaraopeta				
		2	Rudrangi				
		3	Chandurthi				
19	**Rangareddy**	1	Chowdergudem				
		2	Kondurg				
		3	Serilingampally				
		4	Rajendranagar				
20	**Sangareddy**	1	Kandi	1	Patancheruvu		
		2	Sangareddy				
		3	Ameenapur				
		4	Zahirabad				
21	**Siddipet**	1	Kondapak	1	Dubbak		
		2	Narayanraopet				
		3	Komaravelly				
		4	Koheda				
		5	Mirdoddi				
		6	Wargal				
22	**Yadadri Bhuvanagiri**	1	Alair				
ABSTRACT							
Total No. of Assessed Units		Number of Semicritical Assessment Units		Number of Critical Assessment Units		Number of Over Exploited Assessment Units	
612		61		10		11	

CATEGORIZATION of ASSESSMENT UNITS, 2023							
UTTAR PRADESH							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Agra**	1	Pinahat	1	Bah	1	Agra City
		2	Achhnera			2	Etmadpur
		3	Kheragarh			3	Fatehabad
		4	Jagner			4	Bichpuri
		5	Jaitpur Kalan			5	Khandauli
						6	Saiyana
						7	Fatehpur Sikri
						8	Barauli Ahir
						9	Akola
						10	Shamsabad
2	**Aligarh**	1	Gonda	1	Iglas	1	Aligarh City
		2	Khair				
		3	Lodha				
		4	Chandaus				
		5	Gangiri				
		6	Jawa Sikandairpur				
3	**Ambedkar Nagar**	1	Jalalpur				
4	**Amethi**	1	Sangrampur				
5	**Amroha**	1	Gangeshwari	1	Dhanaura	1	Joya
		2	Amroha	2	Gajraula		
		3	Hasanpur				
6	**Bagpat**	1	Baghpat			1	Pilana
		2	Baraut			2	Binauli
		3	Chhaprauli			3	Khekra
7	**Banda**	1	Baberu				
		2	Tindwari				
		3	Naraini				
		4	Jaspura				
8	**Bareilly**	1	Alampur Jafarabad			1	Bareilly City
		2	Ramnagar				
		3	Majhgawa				
		4	Fatehganj				
9	**Bijnor**	1	Seohara (Budhanpur)	1	Jaleelpur		
		2	Kotwali				
		3	Nehtaur (Aaku)				
		4	Noorpur				
10	**Budaun**	1	Sahaswan	1	Asafpur	1	Ambiapur
		2	Quadar Chowk	2	Bisauli	2	Islamnagar
		3	Jagat				
		4	Samrer				
		5	Miaon				
		6	Ujhani				
11	**Bulandshahar**	1	Pahasu	1	Arnia Khurd	1	Sikandrabad
		2	Debai	2	Khurja	2	Bulandshahar
		3	Anup Shahar	3	Shikarpur	3	Siana
		4	Jahangirabad	4	Unchagaon	4	Gulaothi
		5	Lakhaothi			5	Bhawan Bahadur Nagar
						6	Danpur
12	**Chitrakoot**	1	Ramnagar	1	Karwi		
		2	Pahari				
		3	Mau				
13	**Etah**	1	Nidhauli Kalan				
		2	Aliganj				
		3	Jalesar				
		4	Jaithara				
		5	Shitalpur				
14	**Farrukhabad**	1	Mohamadabad				
		2	Barhpur				
		3	Nawabganj				
		4	Kamalganj				
15	**Fatehpur**	1	Telyani			1	Bhitaura
		2	Khajuha				
		3	Malawan				
		4	Airaya				
		5	Amauli				
16	**Firozabad**	1	Madanpur	1	Aron	1	Firozabad
		2	Eka			2	Shikohabad
		3	Jasrana			3	Khairgarh(Hathwant)
						4	Narkhi
						5	Tundla
17	**G.B.Nagar**	1	Dadri	1	Jewar	1	Bisrakh

CATEGORIZATION of ASSESSMENT UNITS, 2023							
UTTAR PRADESH							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
18	**Ghaziabad**	1	Muradnagar			1	Gaziabad City
						2	Bhojpur
						3	Razapur
						4	Loni
19	**Ghazipur**	1	Saidpur				
20	**Hamirpur**	1	Sumerpur				
		2	Gohand				
21	**Hapur**	1	Dholana	1	Simbholi	1	Garh
				2	Hapur		
22	**Hathras**	1	Sikandra Rao	1	Hathras	1	Sahpau
		2	Sadabad			2	Mursan
						3	Sasni
23	**Jaunpur**	1	Kerakat	1	Badlapur		
		2	Sirkoni	2	Maharajganj		
		3	Ramnagar				
		4	Muftiganj				
		5	Karanja Kalan				
		6	Sikrara				
		7	Dharmapur				
24	**Jhansi**	1	Baragaon				
		2	Bangra				
		3	Babina				
		4	Mauranipur				
25	**Kannauj**	1	Gograpur	1	Kannauj	1	Jalalabad
		2	Chhibramau			2	Talgram
26	**Kanpur Dehat**	1	Akbarpur				
		2	Maitha				
		3	Jhinjhak				
		4	Sarwan Khera				
		5	Malsa				
		6	Derapur				
		7	Rasulabad				
27	**Kanpur Nagar**	1	Parara	1	Kanpur City		
		2	Sarsol	2	Chaubepur		
		3	Ghatampur				
		4	Bidhnu				
		5	Bilhaur				
		6	Shivrajapur				
28	**Kasganj**	1	Ganjdundwara				
		2	Patiyali				
		3	Kasganj				
29	**Kaushambi**	1	Manjhanpur			1	Chail
		2	Kara			2	Muratganj
		3	Sirathu				
		4	Newada				
30	**Lalitpur**	1	Talbehat				
		2	Birdha				
		3	Bar				
		4	Jakhora				
		5	Mahroni				
		6	Mandwara				
31	**Lucknow**					1	Lucknow City
32	**Mahoba**	1	Kabrai			1	Panwari
		2	Charkhari			2	Jaitpur
33	**Mainpuri**	1	Jagir			1	Barnahal
		2	Mainpuri				
34	**Mathura**			1	Baldeo	1	Raya
				2	Nohjhil		
35	**Meerut**	1	Rajpura	1	Machhra	1	Meerut City
		2	Meerut	2	Kharkhoda		
		3	Sarurpur				
		4	Hastinapur				
		5	Parichhatgarh				
		6	Mawana Kalan				
36	**Mirzapur**	1	City	1	Majhawan	1	Kon
		2	Chanbey				
		3	Sikhar				

CATEGORIZATION of ASSESSMENT UNITS, 2023							
UTTAR PRADESH							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
37	**Moradabad**	1	Dilari	1	Bilari	1	Moradabad City
		2	Moradabad				
		3	Kundarki (Dengapur)				
		4	Bhagatpur				
		5	Mundapandey				
		6	Chhajlet				
38	**Muzaffarnagar**	1	Shahpur	1	Charthawal	1	Bhaghara
		2	Muzaffarnagar	2	Budhana		
39	**Pratapgarh**	1	Lalganj	1	Shivgarh		
		2	Gaura	2	Sadar		
		3	Baba Belkhar Nath	3	Mandhata		
		4	Patti	4	Sandwa Chandika		
		5	Rampur-Sangramgarh				
		6	Lakshamanpur				
		7	Aspur Deosara				
		8	Kunda				
		9	Mangaraura				
40	**Prayagraj**	1	Bahadurpur	1	Chaka	1	Prayagraj City
		2	Holagarh	2	Sahson		
		3	Saidabad				
		4	Mauaima				
		5	Phulpur				
		6	Pratappur				
		7	Shringverpur Dham				
		8	Dhanupur				
41	**Rampur**	1	Said Nagar				
		2	Chamrauwa				
		3	Shahabad				
		4	Saur				
		5	Milak				
42	**Saharanpur**	1	Deoband			1	Nakur
		2	Rampur Maniharan			2	Sarsawa
		3	Sadhauli Kadeem			3	Gangoh
		4	Ballia Kheri			4	Nagal
		5	Nanauta				
		6	Muzaffarabad				
43	**Sambhal**	1	Gunnaur	1	Sambhal		
		2	Janawai	2	Bahjoi		
		3	Asmoli	3	Pawansa		
				4	Baniakhera		
44	**Sant Ravidas Nagar**	1	Gyanpur				
		2	Deegh				
		3	Suriyawan				
		4	Abhauli				
		5	Aurai				
		6	Bhadohi				
45	**Shamli**	1	Thana Bhawan	1	Kairana	1	Shamli
				2	Kandhala	2	Un
46	**Sonbhadra**	1	Dudhi				
47	**Varanasi**	1	Sevapuri	1	Chiraigaon	1	Varanasi City
		2	Pindra			2	Harahua
		3	Kashi Vidyapith			3	Araziline

ABSTRACT			
Total No. of Assessed Units	**Number of Semicritical Assessment Units**	**Number of Critical Assessment Units**	**Number of Over Exploited Assessment Units**
836	**172**	**43**	**62**

CATEGORIZATION of ASSESSMENT UNITS, 2023							
UTTARAKHAND							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Haridwar**	1	Bhagwanpur				
		2	Bahadrabad				
2	**Nainital**	1	Haldwani				
3	**Udhamsingh Nagar**	1	Kashipur				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
18	4	0	0

CATEGORIZATION of ASSESSMENT UNITS, 2023							
WEST BENGAL							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Dakshin Dinajpur**	1	Kushmundi				
		2	Hilli				
2	**Hugli**	1	Serampur Uttarpara				
		2	Balagarh				
		3	Goghat-II				
3	**Malda**	1	Ratua-II				
4	**Murshidabad**	1	Murshidabad Jiaganj	1	Raninagar-I		
		2	Ragunathganj-I				
		3	Bhagawangola-I				
		4	Nawda				
		5	Raninagar-II				
5	**Nadia**	1	Kaliganj	1	Ranaghat-II		
		2	Karimpur-I	2	Nakashipara		
		3	Hanskhali	3	Santipur		
		4	Haringhata	4	Krishnaganj		
		5	Nabadwip	5	Tehatta-I		
		6	Krishnanagar-II	6	Karimpur-II		
		7	Krishnanagar-I	7	Chapra		
		8	Kalyani	8	Tehatta-II		
6	**North 24 Parganas**	1	Habra-I	1	Basirhat-I		
		2	Gaighata	2	Bongaon		
		3	Barasat-I	3	Deganga		
		4	Bagda				
		5	Baduria				
7	**Paschim Barddhaman**	1	Raniganj				
8	**Paschim Medinipur**	1	Chandrakona-II				
		2	Kharagpur-II				
		3	Garbeta-I				
9	**Purba Barddhaman**	1	Burdwan-II				
		2	Memari-I				
		3	Purbasthali-II				
		4	Manteswar				

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
345	32	12	0

CATEGORIZATION of ASSESSMENT UNITS, 2023							
CHANDIGARH							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	**Chandigarh**	1	Chandigarh				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
1	1	0	0

CATEGORIZATION of ASSESSMENT UNITS, 2023							
DAMAN & DIU							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	Daman					1	Daman
2	Diu					1	Diu

ABSTRACT

Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
2	0	0	2

CATEGORIZATION of ASSESSMENT UNITS, 2023							
DADRA AND NAGAR HAVELI							
S.NO	Name of District	S.NO	Name of Semi-Critical Assessment Units	S.NO	Name of Critical Assessment Units	S.NO	Name of Over-Exploited Assessment Units
1	Dadra Nagar Haveli					1	DADRA NAGAR HAVELI

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
1	0	0	1

CATEGORIZATION of ASSESSMENT UNITS, 2023							
JAMMU AND KASHMIR							
S.NO	Name of District	S.NO	Name of Semi-Critical Assessment Units	S.NO	Name of Critical Assessment Units	S.NO	Name of Over-Exploited Assessment Units
1	**Srinagar Urban**	1	Srinagar Urban				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
20	1	0	0

CATEGORIZATION of ASSESSMENT UNITS, 2023							
LADAKH							
S.NO	Name of District	S.NO	Name of Semi-Critical Assessment Units	S.NO	Name of Critical Assessment Units	S.NO	Name of Over-Exploited Assessment Units
1	Leh	1	Leh				
		2	Nimoo				
		3	Thiksay				
		4	Saspol				
		5	Chuchot				
		6	Kharu				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
18	6	0	0

CATEGORIZATION of ASSESSMENT UNITS, 2023							
LAKSHADWEEP							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Units	S. No	Name of Critical Assessment Units	S. No	Name of Over-Exploited Assessment Units
1	Lakshadweep	1	Kavaratti				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
5	1	0	0

CATEGORIZATION of ASSESSMENT UNITS, 2023							
PUDUCHERRY							
S. No	Name of District	S. No	Name of Semi-Critical Assessment Unit	S. No	Name of Critical Assessment Unit	S. No	Name of Over-Exploited Assessment Unit
1	Puducherry	1	Ozhukarai			1	PUDUCHERRY
		2	Villianur				
		3	Bahour				

ABSTRACT			
Total No. of Assessed Units	Number of Semicritical Assessment Units	Number of Critical Assessment Units	Number of Over Exploited Assessment Units
8	3	0	1

ANNEXURE - IV(B)

Quality Problems in Assessment Units (as in 2023)

NOTE:

 # Only Assessment Units where the Quality Tag of As, F & Salinity have been reported are provided against respective districts and states.

 # The Assessment Units with "C", indicates the phreatic aquifer in the assessment unit is almost/ completely brackish /saline

 # The Quality Tag In Respect of As & F indicates Sporadic Occurrences.

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
ANDHRA PRADESH							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Bapatla					1	Karamchedu (C)
2	Eluru					1	Ganapavaram (C)
						2	Kaikalur (C)
						3	Kalidindi (C)
						4	Mandavalli (C)
						5	Mudinapalle (C)
						6	Nidamarru (C)
3	Guntur					1	Pedanandipadu (C)
						2	Vatticherukuru (C)
4	Kakinada					1	Karapa (C)
						2	Thallarevu (C)
5	Konaseema					1	Allavaram (C)
						2	I Polavaram (C)
						3	Katrenikona (C)
						4	Malikipuram (C)
						5	Mamidikuduru (C)
						6	Sakhinetipalle (C)
						7	Uppalaguptam (C)
6	Krishna					1	Bantumilli (C)
						2	Gudlavalleru (C)
						3	Gudur (Krishna) (C)
						4	Koduru (C)
						5	Kruthivennu (C)
						6	Machilipatnam (C)
						7	Nagayalanka (C)
						8	Nandivada (C)
						9	Pedana (C)
7	West Godavari					1	Akiveedu (C)
						2	Bheemavaram (C)
						3	Kalla (C)
						4	Mogalthur (C)
						5	Narasapuram (C)
						6	Palacole (C)
						7	Palakoderu (C)
						8	Pentapadu (C)
						9	Poduru (C)
						10	Undi (C)
						11	Veeravasaram (C)
						12	Yelamanchili (C)
Total Number of Assessed Units		Number of Assessment Units affected by Fluoride		Number of Assessment Units affected by Arsenic		Number of Assessment Units affected by Salinity	
667		0		0		39	

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
ASSAM							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Cachar			1	Udarbond		
				2	Borkhola		
				3	Sonai		
				4	Katigorah		
				5	Narsingpur		
2	Hailakandi			1	Lala		
				2	Katlicherra		
3	Morigaon			1	Mayang		
4	Nalbari			1	Madhupur		
				2	Tihu (Part)		
				3	Pub Nalbari		
				4	Barigog Banbhag		
5	Karbi Anglong	1	Lumbajong				
		2	Langsomepi				
		3	Bokajan				
		4	Howraghat				

ABSTRACT

Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
245	4	12	0

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023

BIHAR

S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Aurangabad**	1	Madanpur				
		2	Rafiganj				
		3	Kutumba				
		4	Goh				
		5	Nabinagar				
		6	Obra				
		7	Haspura				
		8	Deo				
		9	Aurangabad				
		10	Barun				
2	**Banka**	1	Rajoun				
		2	Barahat				
		3	Katoriya				
		4	Belhar				
		5	Shambhuganj				
		6	Amarpur				
		7	Dhoraiya				
		8	Banka				
		9	Chandan				
		10	Bounsi				
		11	Fullidumar				
3	**Begusarai**			1	Navkothi		
				2	Matihani		
				3	Balia		
				4	Barauni		
				5	Sahebpur Kamal		
				6	Bachwara		
				7	Begusarai		
4	**Bhagalpur**	1	Sanhoula				
		2	Kharik				
		3	Narayanpur				
		4	Naugachhia				
		5	Gauradih				
5	**Bhojpur**			1	Bihiya		
				2	Shahpur		
				3	Barhara		
				4	Udwantnagar		
				5	Ara Sadar		
				6	Koilwar		
6	**Buxar**			1	Chakki		
				2	Brahmpur		
				3	Simri		
				4	Buxar		
7	**Darbhanga**			1	Biraul		
				2	Baheri		
8	**Gaya**	1	Tankuppa				
		2	Sherghati				
		3	Imamganj				
		4	Muhra				
		5	Barachatty				
		6	Atri				
		7	Paraiya				
		8	Neemchak Bathani				
		9	Guraru				
		10	Mohanpur				
		11	Tekari				
		12	Amas				
		13	Gurua				
		14	Manpur				
		15	Bodh Gaya				
		16	Belaganj				
		17	Khizar Sarai				
		18	Banke Bazar				
		19	Konch				
		20	Wazirganj				
		21	Gaya Sadar				
		22	Dumariya				
		23	Dobhi				
		24	Fatehpur				
9	**Jamui**	1	Khaira				
		2	Barhat				
		3	Sikandra				
		4	Laxmipur				
		5	Jamui				
		6	Sono				
		7	Islamnagar Aliganj				
		8	Chakai				
		9	Jhajha				
		10	Gidhaur				

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
BIHAR							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
10	**Jehanabad**	1	Ratni Faridpur				
		2	Jehanabad				
		3	Hulasgunj				
11	**Kaimur**	1	Mohania				
		2	Chand				
		3	Nuaon				
		4	Durgawati				
		5	Kudra				
		6	Chainpur				
		7	Bhagwanpur				
		8	Ramgarh				
		9	Bhabhua				
		10	Rampur				
12	**Katihar**			1	Amdabad		
				2	Mansahi		
				3	Kursela		
				4	Manihari		
				5	Sameli		
				6	Balrampur		
13	**Khagaria**			1	Parbatta		
				2	Gogri		
				3	Mansi		
				4	Khagaria		
14	**Kishanganj**			1	Bahadurganj		
				2	Kishanganj		
15	**Lakhisarai**	1	Ramgarh Chowk	1	Surajgarha		
				2	Lakhisarai		
				3	Piparia		
				4	Barahia		
16	**Munger**	1	Tetiyabambar				
		2	Tarapura				
		3	Haveli Kharagpur				
		4	Asarganj				
		5	Sangrampur				
17	**Nalanda**	1	Noorsarai				
		2	Ekangarsarai				
		3	Islampur				
		4	Rahui				
		5	Hilsa				
		6	Biharsharif				
		7	Parwalpur				
		8	Asthawan				
		9	Chandi				
		10	Karai Parsarai				
		11	Rajgir				
		12	Harnaut				
		13	Ben				
		14	Sarmera				
		15	Silao				
		16	Bind				
		17	Nagarnausa				
		18	Giriyak				
		19	Tharthari				
		20	Katrisarai				
18	**Nawada**	1	Warisaliganj				
		2	Nawada				
		3	Hisua				
		4	Rajauli				
		5	Kawakole				
		6	Govindpur				
		7	Roh				
		8	Pakaribarawan				
		9	Narhat				
		10	Kashichak				
		11	Meskaur				
		12	Akbarpur				
		13	Nardiganj				
		14	Sirdala				
19	**Patna**			1	Danapur		
				2	Barh		
				3	Maner		
				4	Bakhtiyarpur		
20	**Purnea**			1	Purnea		
				2	Kasba		

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
BIHAR							
S. No	Name of District	S. No	Name of Assessment Units	S. No	Name of Assessment Units	S. No	Name of Assessment Units
21	**Rohtas**	1	Karakat				
		2	Bikramganj				
		3	Sanjhauli				
		4	Kargahar				
		5	Nasriganj				
		6	Chenari				
		7	Akorhigola				
		8	Dinara				
		9	Sheosagar				
		10	Nokha				
		11	Dawath				
		12	Dehri				
22	**Samastipur**			1	Patori		
				2	Mohanpur		
				3	Mohiuddin Nagar		
				4	Vidyapatinagar		
23	**Saran**			1	Sonepur		
				2	Chapra Sadar		
				3	Dighwara		
				4	Rivilganj		
24	**Sheikhpura**	1	Sheikhpura				
		2	Ghat Kusumba				
		3	Chewara				
		4	Sheikhopur Sarai				
		5	Ariyari				
		6	Barbigha				
25	**Vaishali**			1	Sahdai		
				2	Hajipur		
				3	Desri		
				4	Raghopur		
				5	Bidupur		

ABSTRACT

Total No. of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
535	**131**	**54**	**0**

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
CHHATISGARH							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Balrampur	1	Balrampur				
2	Gariaband	1	Chhura				
		2	Deobhog				
		3	Gariaband				
3	Gourela-Pendra-Marwahi	1	Marwahi				
4	Jashpur	1	Bagicha				
		2	Kunkuri				
		3	Pharsabahar				
5	Korea	1	Kartala				
		2	Katghora				
		3	Korba				
		4	Pali				
6	Mahasamund	1	Bagbahara				
7	Mohla-Manpur-Ambagarhchowki			1	Ambagarh Chowki		
8	Raigarh	1	Dharamjaigarh				
		2	Lailunga				
		3	Tamnar				
9	Sarangarh-Bilairagh	1	Sarangarh				
10	Surajpur	1	Pratappur				
		2	Premnagar				
		3	Ramanujnagar				

ABSTRACT			
Total No. of Assessed Units	Number of Assessment Unit affected by Fluoride	Number of Assessment Unit affected by Arsenic	Number of Assessment Unit affected by Salinity
146	20	1	0

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
DELHI							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**New Delhi**					1	Delhi Cantonment
						2	Vasant Vihar
2	**North**					1	Alipur
						2	Narela
						3	Model Town
3	**North West**					1	Saraswati Vihar
						2	Rohini
						3	Kanjhawala
4	**South West**					1	Najafgarh
						2	Kapashera
						3	Dwarka
5	**West**					1	Punjabi Bagh
						2	Rajouri Garden
						3	Patel Nagar

ABSTRACT

Total No. of Assessed Units	Number of Assessment Unit affected by Fluoride	Number of Assessment Unit affected by Arsenic	Number of Assessment Unit affected by Salinity
34	0	0	14

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023

GUJARAT

S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Ahmedabad**	1	Bavla			1	Dhandhuka (C)
		2	Dholka			2	Dholera (C)
		3	Sanand				
2	**Amreli**	1	Dhari				
		2	Rajula				
3	**Arvalli**	1	Bayad				
		2	Bhiloda				
		3	Dhansura				
		4	Malpur				
		5	Meghraj				
		6	Modasa				
4	**Banaskantha**	1	Bhabhar			1	Bhabhar (C)
		2	Vav			2	Suigam (C)
		3	Amirgadh			3	Vav (C)
		4	Danta				
		5	Dantiwada				
		6	Deesa				
		7	Deodar				
		8	Dhanera				
		9	Kankrej				
		10	Lakhani				
		11	Palanpur				
		12	Tharad				
		13	Vadgam				
5	**Bhavnagar**	1	Mahuva				
		2	Talaja				
		3	Vallabhipur				
6	**Botad**	1	Barwala				
		2	Ranpur				
7	**Devbhumi Dwarka**	1	Kalyanpur				
		2	Okhamandal				
8	**Gandhinagar**	1	Mansa				
		2	Kodinar				
9	**Kachchh**	1	Abdasa			1	Gandhidham (C)
		2	Mundra				
		3	Nakhatrana				
10	**Kheda**	1	Kathlal				
11	**Mahesana**	1	Becharaji				
		2	Kadi				
		3	Kheralu				
		4	Mahesana				
		5	Satlasana				
		6	Unjha				
		7	Vadnagar				
		8	Vijapur				
		9	Visnagar				
12	**Mahisagar**	1	Santrampur				
		2	Virpur				
13	**Morbi**	1	Tankara			1	Maliya (C)
14	**Navsari**	1	Gandevi				
15	**Patan**	1	Harij			1	Harij (C)
		2	Sami			2	Sami (C)
		3	Chanasma			3	Santalpur (C)
		4	Patan			4	Radhanpur (C)
		5	Radhanpur			5	Sankheswar (C)
		6	Sankheswar				
16	**Rajkot**	1	Gondal				
17	**Sabarkantha**	1	Himatnagar				
		2	Idar				
		3	Khedbrahma				
		4	Talod				
		5	Vadali				
18	**Surat**	1	Mandvi				
		2	Palsana				
19	**Surendranagar**	1	Chuda				
		2	Dasada				
		3	Lakhtar				
		4	Limbdi				
		5	Muli				

ABSTRACT

Total No. of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
252	69	0	12

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
HARYANA							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Bhiwani**	1	Tosham			1	Siwani
						2	Bhiwani
						3	Bawani Khera
2	**Charkhi Dadri**					1	Baund
						2	Jhojhu
						3	Badhra
3	**Faridabad**	1	Ballabgarh				
4	**Fatehabad**	1	Fatehabad				
5	**Gurgaon**	1	Pataudi			1	Farrukh Nagar
6	**Hisar**					1	Uklana
						2	Narnaund
						3	Adampur
						4	Hansi
						5	Barwala
						6	Hisar-I
						7	Agroha
						8	Hansi-Ii
7	**Jhajjar**	1	Salhawas			1	Bahadurgarh
						2	Matannail
						3	Beri
8	**Jind**	1	Safidon			1	Narwana
		2	Jind				
		3	Uchana				
		4	Ujhana				
		5	Julana				
9	**Kaithal**	1	Rajound			1	Kalayat
						2	Guhla
						3	Kaithal
10	**Mahendragarh**					1	Kanina
						2	Mahendragarh
11	**Mewat**					1	Punahana
						2	Indri
						3	Nuh
						4	Nagina
						5	Ferozepur Jhirka
12	**Palwal**	1	Badoli			1	Hathin
						2	Hodal
						3	Palwal
13	**Panipat**	1	Madlauda	1	Israna		
		2	Panipat				
		3	Samalkha				
14	**Rewari**	1	Bawal	1	Rewari	1	Nahar
15	**Rohtak**	1	Kalanaur			1	Rohtak
		2	Lakhan Majra			2	Maham
		3	Sampla				
16	**Sirsa**	1	Sirsa	1	Ellenabad	1	Odhan
						2	Nathusari Chopta
						3	Rania
						4	Baragudha
						5	Dabwali
17	**Sonipat**	1	Gohana			1	Mundlana
						2	Kharkhoda

ABSTRACT

Total No. of Assessed Units	Number of Assessment Unit affected by Fluoride	Number of Assessment Unit affected by Arsenic	Number of Assessment Unit affected by Salinity
143	21	3	42

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
JHARKHAND							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Bokaro	1	Chandan Kiyari				
		2	Peterbar				
		3	Chas				
2	Dhanbad	1	Baliapur				
		2	Dhanbad				
3	Garhwa	1	Kandi				
		2	Bhandaria				
		3	Bhawanathpur				
		4	Dhurki				
		5	Ramna				
		6	Majhiaon				
		7	Garhwa				
		8	Dandai				
		9	Chinia				
		10	Meral				
		11	Ramkanda				
		12	Untari				
		13	Ranka				
4	Giridih	1	Tisri				
		2	Giridih				
5	Godda	1	Pathargama				
		2	Godda				
		3	Poreyahat				
		4	Mahagama				
		5	Boarijor				
6	Gumla	1	Dumri				
		2	Gumla				
		3	Ghaghra				
7	Khunti	1	Murhu				
		2	Karra				
8	Koderma	1	Markachho				
		2	Jainagar				
		3	Chandwara				
		4	Koderma				
		5	Satgawan				
9	Pakur	1	Litipara				
		2	Amrapara				
		3	Pakuria				
10	Palamau	1	Leslieganj				
		2	Chhatarpur				
		3	Bishrampur				
		4	Hariharganj				
		5	Panki				
		6	Patan				
		7	Daltonganj				
		8	Chainpur				
		9	Satbarwa				
		10	Pandu				
		11	Manatu				
11	Ranchi	1	Silli				
		2	Namkum				
		3	Ormanjhi				
12	Sahebganj	1	Barhait				
		2	Borio				

ABSTRACT			
Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
263	54	0	0

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
KARNATAKA							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Bagalkot**					1	Badami
						2	Hungund
						3	Jamakhandi
2	**Ballari**	1	Siraguppa			1	Siraguppa
		2	Ballari				
3	**Chitradurga**	1	Molakalmuru			1	Holalkere
4	**Dharwad**					1	Navalgund
5	**Davanagere**	1	Harihar				
		2	Davanagere				
6	**Gadag**					1	Gajendragad
						2	Kukanuru
						3	Naragund
						4	Rona
						5	Shirahatti
7	**Koppal**					1	Yelburga
8	**Kalburgi**	1	Chincholi				
9	**Kolara**	1	Mulabagilu				
10	**Raichur**	1	Maski			1	Manvi
		2	Lingasugur			2	Sindhanur
		3	Devdurga				
11	**Vijayanagara**	1	Kudligi				
12	**Vijayapura**	1	Sindagi			1	Basavan Bagewadi
		2	Muddebihal			2	Muddebihal
						3	Sindagi
13	**Yadgir**	1	Shorapur				

ABSTRACT

Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
234	14	0	17

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
KERALA							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Malappuram	1	Areacode				
2	Thrissur					1	Thalikkulam

ABSTRACT			
Total No. of Assessed Units	Number of Assessment Unit affected by Fluoride	Number of Assessment Unit affected by Arsenic	Number of Assessment Unit affected by Salinity
152	1	0	1

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
MADHYA PRADESH							
S.NO	Name of District	S.NO	Name of Assessment Units affected by Fluoride	S.NO	Name of Assessment Units affected by Arsenic	S.NO	Name of Assessment Units affected by Salinity
1	**Alirajpur**	1	Alirajpur				
2	**Bhind**					1	Mehgaon
						2	Gohad
3	**Chhindwara**	1	Mohkheda				
		2	Chhindwara				
		3	Parasia				
		4	Bichhua				
		5	Chaurai				
		6	Tamia				
		7	Sausar				
		8	Jamai				
		9	Amarwara				
		10	Pandhurna				
4	**Dhar**	1	Tirla				
		2	Nalchha				
		3	Umarvan				
		4	Manawar				
		5	Dhar				
		6	Badnawar				
		7	Bagh				
		8	Gandhwani				
		9	Nisarpur				
		10	Sardarpur				
		11	Dahi				
		12	Dharmpuri				
5	**Jhabua**	1	Jhabua				
		2	Ranapur				
		3	Petlawad				
		4	Rama				
		5	Thandla				
6	**Mandla**	1	Mohgaon				
		2	Ghughari				
		3	Mandla				
7	**Ratlam**	1	Sailana				
		2	Bajna				
8	**Sehore**	1	Ashta				
		2	Sehore				
		3	Nasrullaganj				
		4	Ichhawar				
9	**Seoni**	1	Ghansaur				
		2	Kurai				
		3	Chhapara				
		4	Seoni				
		5	Keolari				
		6	Barghat				
10	**Shajapur**	1	Kalapipal				
		2	Moman Badodiya				
		3	Shajapur				
		4	Shujalpur				
11	**Vidisha**	1	Vidisha				

ABSTRACT

Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
317	48	0	2

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023

MAHARASHTRA

S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Ahmednagar					1	Nagar
						2	Newasa
						3	Parner
						4	Rahuri
						5	Shrigonda
2	Akola					1	Akola
						2	Akot
						3	Balapur
						4	Murtizapur
						5	Telhara
3	Amravati					1	Achlapur
						2	Amravati
						3	Anjangaon Surji
						4	Bhatkuli
						5	Chandur Bazar
						6	Daryapur (C)
4	Buldhana					1	Jalgaon
						2	Nandura
						3	Sangrampur
						4	Shegaon
5	Pune					1	Baramati
						2	Daund
						3	Indapur
						4	Purandhar
6	Sangli					1	Miraj
						2	Palus
						3	Shirala
						4	Tasgaon
						5	Walwa

ABSTRACT

Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
353	0	0	25

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
ODISHA							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Balasore					1	Bahanaga
						2	Balasore
						3	Baliapal
						4	Basta
						5	Bhograi
						6	Remuna
2	Bhadrak					1	Basudevpur
						2	Chandbali(C)
						3	Dhamnagar
						4	Tihidi
3	Ganjam					1	Chhatrapur
						2	Chikiti
						3	Ganjam
						4	Khalikote
						5	Rangeilunda
4	Jagatsinghpur					1	Balikuda
						2	Ersama(C)
						3	Kujanga
						4	Naugaon
5	Jajpur					1	Bari
						2	Binjharpur
						3	Dasarathpur
6	Kendrapara					1	Aul
						2	Derabish
						3	Garadpur
						4	Kendrapara
						5	Mahakalpada(C)
						6	Marshaghai(C)
						7	Pattamundai
						8	Rajkanika (C)
						9	Rajnagar (C)
7	Puri					1	Astarang
						2	Brahmagiri
						3	Delang
						4	Gop
						5	Kakatpur
						6	Kanas
						7	Krushnaprasad
						8	Nimapara
						9	Pipili
						10	Puri
						11	Satyabadi

ABSTRACT			
Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
314	0	0	42

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
PUNJAB							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Amritsar**			1	Ajnala		
2	**Barnala**						
3	**Bathinda**	1	Nathana			1	Sangat
						2	Talwandi Sabo
						3	Bathinda
4	**Faridkot**					1	Faridkot
5	**Fazilka**					1	Fazilka
						2	Khuian Sarwar
						3	Abohar
						4	Jalalabad
6	**Gurdaspur**			1	Dera Baba Nanak		
7	**Hoshiarpur**			1	Mukerian		
8	**Mansa**	1	Bhikhi			1	Mansa
						2	Jhunir
						3	Budhlada
9	**Moga**	1	Moga-2				
10	**Muktsar**					1	Lambi
						2	Muktsar
						3	Malout
11	**Rupnagar**			1	Rupnagar		
12	**Sangrur**	1	Lehra Gaga				
13	**Tarn Taran**	1	Patti	1	Bhikhiwind		

ABSTRACT			
Total No. of Assessed Units	Number of Assessment Unit affected by Fluoride	Number of Assessment Unit affected by Arsenic	Number of Assessment Unit affected by Salinity
153	5	5	14

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
RAJASTHAN							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Bikaner**					1	Khajuwala (C)
2	**Churu**					1	Taranagar (C)
3	**Dausa**	1	Sikrai				
		2	Lawan				
		3	Bandikui				
		4	Dausa				
		5	Mahwa				
4	**Hanumangarh**					1	Rawatsar (C)
5	**Jhalawar**	1	Aklera				
		2	Dag				
		3	Bakani				
6	**Karauli**	1	Karauli				
		2	Hindaun				
7	**Nagaur**	1	Didwana				
		2	Parbatsar				
		3	Kuchaman City				
8	**Sawai Madhopur**	1	Gangapur				
		2	Sawai Madhopur				
		3	Chauth Ka Barwara				
		4	Khandar				
		5	Bonli				
		6	Bamanwas				
9	**Sirohi**	1	Abu Road				
		2	Reodar				
		3	Pindwara				
		4	Sirohi				
		5	Sheoganj				

ABSTRACT

Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
302	24	0	3

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
TAMIL NADU							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Coimbatore**	1	Saravanampatti				
2	**Cuddalore**	1	Thozhudur				
3	**Dharmapuri**	1	Bommidi				
		2	Dharmapuri				
		3	Harur				
		4	Indur				
		5	Karimangalam				
		6	Marandahalli				
		7	Morappur				
		8	Nallampalli				
		9	Palacode				
		10	Pappireddipatty				
		11	Pennagaram				
		12	Pulikarai				
		13	Theerthamalai				
4	**Dindigul**	1	Vatlagundu				
5	**Erode**	1	Ammapettai				
		2	Sathyamangalam				
		3	Vaniputhur				
6	**Kallakkurichi**	1	Thirukoilur				
7	**Karur**	1	Chinnadharapuram				
		2	K.Paramathy				
		3	Pugalur				
8	**Krishnagiri**	1	Bagalur				
		2	Bargur				
		3	Barur				
		4	Hosur				
		5	Kelamangalam				
		6	Krishnagiri				
		7	Mathur				
		8	Pochampalli				
		9	Shoolagiri				
		10	Uthangarai				
		11	Veppanapalli				
9	**Madurai**	1	Melur				
		2	Neerathan				
		3	Othakkadai				
		4	T.Kallupatti				
		5	Thirumangalam				
10	**Namakkal**	1	Nallipalayam				
		2	Namakkal				
		3	Paramathi				
11	**Nagapattinam**					1	Valivalam
						2	Thalainayar
						3	Nagappattinam (C)
						4	Nirmulai
						5	Thillayadi
						6	Thirukannapuram
						7	Thirukkuvalai (C)
						8	Kariyapattinam
						9	Thagatur
						10	Kilvelur (C)
						11	Kangalancheri
						12	Thirumarugal
						13	Keelaiyur
						14	Therkupoigainallur
						15	Thevoor
						16	Vedaranyam (C)
						17	Velanganni
12	**Perambalur**	1	Varagur				
13	**Pudukottai**	1	Karaiyur			1	Perumaruthur
						2	Kottaipattinam
						3	Sinkavanam
14	**Ranipet**	1	Ranipet				
15	**Ramanathapuram**	1	Keelakkarai			1	Thirupullani
						2	Kadaladi
						3	Sikkal
						4	Mangalakudi
						5	Mudukulathur South
						6	Melachelvanur
						7	Thondi
						8	Sayalkudi
						9	S.Tharaikudi
16	**Salem**	1	Edappadi				
		2	Ernapuram				
		3	Gangavalli				
		4	Kadayampatti				
		5	Karippatti				
		6	Konganapuram				
		7	Mettur				
		8	Salem Town				
		9	Veerapandi				
		10	Vembadithalam				
17	**Sivaganga**	1	Kallal				
		2	Pallathur				
		3	Sivagangai				
18	**Tenkasi**	1	Alankulam				

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
TAMIL NADU							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
19	**Tirupathur**	1	Alangayam				
		2	Andiyappanur				
		3	Tirupathur				
		4	Vaniyambadi				
20	**Theni**	1	Cumbam				
		2	Devathanapatti				
21	**Thiruvallur**					1	Minjur
22	**Thiruvarur**					1	Muthupet
						2	Thiruthuraipoondi (C)
						3	Edaiyur
						4	Alathampadi
23	**Tiruchirapalli**	1	Trichy West Taluk-Tr				
		2	Trichy West Taluk-Tr				
24	**Tiruppur**	1	Avinashipalayam(S)				
		2	Kangeyam				
		3	Mulanur				
		4	Nallur				
		5	Tiruppur (S)				
		6	Vellakoil				
25	**Tiruvannamalai**	1	Melpallipattu				
26	**Villupuram**	1	Arasur				
		2	Avanipur				
ABSTRACT							
Total No. of Assessed Units		Number of Assessment Unit affected by Fluoride		Number of Assessment Unit affected by Arsenic		Number of Assessment Unit affected by Salinity	
1202		77		0		34	

Note:- In Tamil Nadu State the Ground Water Resources are assessed Firka wise and for the 2023 Ground Water Resource Assessment, 1202 Firkas were assessed. For Uniformity in National Report the groundwater resources of the Firkas falling in a Taluka have been added to calculate the groundwater resources for the respective Talukas

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
TELANAGNA							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Bhadradri Kothagudem**	1	Bhadrachalam				
		2	Yellandu				
2	**Jagtial**	1	Kathlapur				
		2	Kodimial				
3	**Jangaon**	1	Lingalaghanpur				
4	**Jogulamba Gadwal**	1	Gadwal				
5	**Kamareddy**	1	Banswada				
6	**Karimnagar**	1	Manakondur				
		2	Ramadugu				
7	**Khammam**	1	Kalluru				
		2	Kamepalle				
		3	Khammam Rural				
		4	Konijerla				
		5	Madhira				
		6	Mudigonda				
		7	Penuballi				
		8	Raghunadhapalem				
		9	Singareni				
		10	Vemsoor				
		11	Wyra				
		12	Yerrupalem				
8	**Komarambheem**	1	Bejjur				
		2	Dahegaon				
9	**Mahabubabad**	1	Bayyaram				
		2	Danthalapalle				
		3	Kuravi				
		4	Narsimhulapet				
		5	Nellikudur				
		6	Peddavangara				
		7	Inugurthy				
		8	Seerole				
10	**Mahabubnagar**	1	Nawabpet				
11	**Mancherial**	1	Bellampalle				
12	**Medak**	1	Chegunta				
13	**Medchal Malkajgiri**	1	Bachpalle				
		2	Balanagar				
		3	Dundigal Gandimaisamma				
		4	Ghatkesar				
		5	Malkajgiri				
		6	Medchel				
14	**Mulug**	1	Govindaraopet				
15	**Nagarkurnool**	1	Charakonda				
		2	Lingal				
		3	Peddakothapalle				
		4	Tadoor				
		5	Urkonda				
		6	Vangoor				
16	**Nalgonda**	1	Anumula Haliya				
		2	Chandur				
		3	Chinthapalle				
		4	Devarakonda				
		5	Kethepalle				
		6	Marriguda				
		7	Miryalaguda				
		8	Nakrekal				
		9	Peddavura				
		10	Vemulapalle				
		11	Gattuppal				
17	**Narayanpet**	1	Dhanwada				
		2	Krishna				
18	**Nirmal**	1	Kaddampeddur				
		2	Sarangapur				
19	**Nizamabad**	1	Rudrur				
20	**Peddapalle**	1	Julapalle				
21	**Rajanna Siricilla**	1	Yellareddypeta				
22	**Rangareddy**	1	Manchal				
	Rangareddy	2	Yacharam				
23	**Sangareddy**	1	Sangareddy				
24	**Siddipet**	1	Bejjanki				
		2	Gajwel				
		3	Mulug				
25	**Suryapet**	1	Chivvemla				

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
TELANAGNA							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
26	**Warangal**	1	Geesugonda				
		2	Khanapur				
		3	Nallabelly				
		4	Narsampet				
		5	Nekkonda				
		6	Khilla Warangal				
27	**Hanumakonda**	1	Parkal				
		2	Elkathurthi				
		3	Kamalapur				
28	**Yadadri Bhuvanagiri**	1	Bhongiri				
		2	Choutuppal				
		3	Yadagirigutta				

ABSTRACT			
Total Number of Assessed Units	**Number of Assessment Units affected by Fluoride**	**Number of Assessment Units affected by Arsenic**	**Number of Assessment Units affected by Salinity**
612	**84**	**0**	**0**

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023

UTTAR PRADESH

S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	**Agra**	1	Saiyan			1	Achhnera
		2	Etmadpur			2	Akola
		3	Khandauli			3	Kheragarh
						4	Etmadpur
						5	Fatehpur Sikri
						6	Jagner
						7	Saiyan
2	**Aligarh**	1	Nama			1	Gonda
						2	Khair
3	**Ayodhya**			1	Bikapur		
				2	Harringtanganj		
4	**Azamgarh**	1	Palhana	1	Maharajganj		
5	**Bahraich**			1	Chittaura		
				2	Jarwal		
				3	Mihipurwa		
				4	Mahasi		
				5	Nawabganj		
				6	Payagpur		
				7	Risiya		
6	**Ballia**			1	Dubahar		
				2	Reoti		
				3	Murali Chhapara		
				4	Belhari		
7	**Balrampur**			1	Tulsipur		
				2	Harraiya Satgarhwa		
8	**Barabanki**			1	Suratganj		
9	**Bareilly**			1	Meerganj		
10	**Basti**			1	Bankati		
11	**Bijnor**			1	Dhampur (Alhepur)		
				2	Noorpur		
				3	Kiratpur		
				4	Nehtaur (Aaku)		
				5	Mohammadpur Deomal		
12	**Budaun**			1	Dataganj		
13	**Bulandashar**			1	Amarpur		
14	**Deoria**			1	Bhaluwani		
				2	Barhaj		
15	**Etah**					1	Jalesar
16	**Fatehpur**	1	Malwan			1	Malwan
		2	Teliyani				
17	**Farrukhabad**	1	Rajepur	1	Amritpur		
18	**Firozabad**	1	Tundla	1	Aron	1	Firozabad
19	**G.B.Nagar**	1	Dankaur			1	Bisrakh
						2	Zewar
20	**Gonda**			1	Belsar		
				2	Katra Bazar		
21	**Gorakhpur**			1	Gagaha		
22	**Hamirpur**					1	Sareela
						2	Rath
						3	Maudaha
23	**Hapur**			1	Simbholi		
24	**Hardoi**			1	Kacchauana		
				2	Tadiyawan		
25	**Hathras**	1	Mursan			1	Aharai
		2	Sasni				
26	**J. P Nagar (Amroha)**	1	Amroha				
27	**Kanpur Dehat**	1	Akbarpur				
28	**Kannauj**			1	Talagram		
29	**Kushi Nagar**			1	Sewarhi		
				2	Dudhai		
30	**Lakhimpur Kheri**			1	Nakaha		
				2	Nighasan		
				3	Ishanagasr		
				4	Gola		
31	**Lalitpur**	1	Bar				

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
UTTAR PRADESH							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
32	Maharajganj			1	Ghughuli		
				2	Maharajganj		
				3	Nichlaul		
33	Mainpuri	1	Kishni				
		2	Katra Saman				
34	Mathura	1	Baldeo			1	Chaumuhan
		2	Chhata			2	Goverdhan
		3	Mant			3	Mant
		4	Raya			4	Nohjhil
		5	Goverdhan			5	Farah
						6	Raya
35	Mirzapur			1	Kon		
36	Moradabad			1	Moondha Pandey		
				2	Chhajlet		
				3	Bhagatpur Tanda		
37	Muzaffarnagar			1	Jansath		
38	Pratapgarh	1	Baba Belkhar Nath				
		2	Gaura				
39	Pilibhit			1	Barkhera		
40	Raibareli	1	Chhatoh	1	Khiron		
		2	Lalganj				
		3	Rohina				
41	Rampur	1	Milak				
		2	Said Nagar				
		3	Shahabad				
		4	Swar				
42	Sant Kabir Nagar			1	Paulli		
43	Shahjahanpur			1	Dadraul		
44	Siddharth Nagar			1	Uskabazar		
				2	Jogiya		
				3	Naugarh		
				4	Shoharatgarh		
45	Sitapur			1	Rampur Mathura		
46	Unnao					1	Asoha

ABSTRACT			
Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
836	31	60	25

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023

WEST BENGAL

S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Bankura	1	Chhatna				
		2	Saltora				
		3	Hirbandh				
		4	Raipur				
		5	Indpur				
		6	Simlapal				
		7	Bankura-II				
		8	Barjora				
		9	Gangajalghati				
		10	Taldangra				
2	Birbhum	1	Rajnagar				
		2	Suri-II				
		3	Dubrajpur				
		4	Nalhati-I				
		5	Rampurhat-I				
		6	Mayureswar-I				
		7	Khoyrasol				
3	Dakshin Dinajpur	1	Gangarampur				
		2	Kushmundi				
		3	Bansihari				
		4	Tapan				
		5	Kumarganj				
4	Haora					1	Sankrail (C)
						2	Uluberia-I (C)
						3	Bagnan-II (C)
						4	Uluberia-II (C)
						5	Bally Jagachha (C)
						6	Bagnan-I (C)
						7	Shyampur-II (C)
						8	Panchla (C)
						9	Shyampur-I (C)
5	Hugli			1	Balagarh		
6	Kolkatta					1	Kmc (C)
7	Malda	1	Bamangola	1	Manikchak		
				2	Kaliachak-III		
				3	English Bazar		
				4	Ratua-I		
				5	Kaliachak-I		
				6	Kaliachak-II		
8	Murshidabad			1	Lalgola		
				2	Samserganj		
				3	Hariharpara		
				4	Murshidabad Jiaganj		
				5	Ragunathganj-I		
				6	Bhagawangola-I		
				7	Berhampore		
				8	Raninagar-I		
				9	Beldanga-II		
				10	Bhagawangola-II		
				11	Beldanga-I		
				12	Suti-II		
				13	Nawda		
				14	Jalangi		
				15	Domkal		
				16	Raninagar-II		
				17	Farakka		
				18	Ragunathganj-II		
				19	Suti-I		
9	Nadia			1	Ranaghat-II		
				2	Kaliganj		
				3	Nakashipara		
				4	Karimpur-I		
				5	Ranaghat-I		
				6	Santipur		
				7	Hanskhali		
				8	Krishnaganj		
				9	Tehatta-I		
				10	Haringhata		
				11	Nabadwip		
				12	Karimpur-II		
				13	Chapra		
				14	Tehatta-II		
				15	Krishnanagar-II		
				16	Krishnanagar-I		
				17	Chakdah		

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023

WEST BENGAL

S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
10	**North 24 Parganas**			1	Barasat-II	1	Minakhan (C)
				2	Haroa	2	Sandeshkhali-I (C)
				3	Basirhat-I	3	Hingalganj (C)
				4	Bongaon	4	Sandeshkhali-II (C)
				5	Habra-I	5	Hasnabad (C)
				6	Barrackpur-I		
				7	Gaighata		
				8	Amdanga		
				9	Deganga		
				10	Barasat-I		
				11	Bagda		
				12	Barrackpur-II		
				13	Baduria		
				14	Basirhat-II		
				15	Habra-II		
				16	Rajarhat		
				17	Swarupnagar		
11	**Purba Barddhaman**			1	Kalna-II		
				2	Katwa-I		
				3	Katwa-II		
				4	Purbasthali-II		
				5	Purbasthali-I		
12	**Purba Medinipur**					1	Ramnagar-I (C)
						2	Contai-II (C)
						3	Tamluk (C)
						4	Nandigram-I (C)
						5	Mahisadal (C)
						6	Ramnagar-II (C)
						7	Contai-III (C)
						8	Sutahata (C)
						9	Contai-I (C)
						10	Nandigram-II (C)
						11	Haldia (C)
						12	Sahid Matangini (C)
						13	Nanda Kumar (C)
						14	Khejuri-II (C)
						15	Nandigram-III (C)
						16	Khejuri-I (C)
13	**Puruliya**	1	Puncha				
		2	Para				
		3	Arsha				
		4	Kashipur				
		5	Purulia-II				
		6	Neturia				
		7	Balarampur				
		8	Santuri				
		9	Bagmundi				
		10	Purulia-I				
		11	Hura				
		12	Raghunathpur-I				
		13	Jhalda-I				
		14	Manbazar-I				
		15	Jaipur				
		16	Raghunathpur-II				
		17	Barabazar				
14	**South 24 Parganas**					1	Bhangar-I (C)
						2	Kultali (C)
						3	Bishnupur-I (C)
						4	Magrahat-I (C)
						5	Budge Budge-II (C)
						6	Canning-II (C)
						7	Gosaba (C)
						8	Kakdwip (C)
						9	Mathurapur-I (C)
						10	Kulpi (C)
						11	Mathurapur-II (C)
						12	Namkhana (C)
						13	Diamond Harbour-II (C)
						14	Sagar (C)
						15	Thakurpukur Mahestala (C)
						16	Bhangar-II (C)
						17	Budge Budge-I (C)
						18	Jaynagar-II (C)
						19	Mandirbazar (C)
						20	Diamond Harbour-I (C)
						21	Basanti (C)
						22	Bishnupur-II (C)
						23	Patharpratima (C)
						24	Jaynagar-I (C)
						25	Sonarpur (C)
						26	Magrahat-II (C)
						27	Baruipur (C)
						28	Canning-I (C)
						29	Falta (C)
15	**Uttar Dinajpur**	1	Itahar				

ABSTRACT

Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
345	**41**	**65**	**60**

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
ANDAMAN & NICOBAR ISLANDS							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Nicobar					1	Chowra (C)

ABSTRACT			
Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
9	0	0	1

NOTE- In Andaman & Nicobar Islands, there are 9 blocks which can be further separted into 36 islands. Of the 36 islands, Chowra Island is saline

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
PUDUCHERRY							
S. No	Name of District	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Puducherry					1	Yanam (C)

ABSTRACT			
Total Number of Assessed Units	Number of Assessment Units affected by Fluoride	Number of Assessment Units affected by Arsenic	Number of Assessment Units affected by Salinity
8	0	0	1

QUALITY PROBLEMS IN ASSESSMENT UNITS, 2023							
S. No	Name of State	S. No	Name of Assessment Units affected by Fluoride	S. No	Name of Assessment Units affected by Arsenic	S. No	Name of Assessment Units affected by Salinity
1	Arunachal Pradesh		0		0		0
2	Goa		0		0		0
3	Himachal Pradesh		0		0		0
4	Manipur		0		0		0
5	Meghalaya		0		0		0
6	Mizoram		0		0		0
7	Nagaland		0		0		0
8	Sikkim		0		0		0
9	Tripura		0		0		0
10	Uttarakhand		0		0		0
11	Chandigarh		0		0		0
12	Dadra & Nagar Haveli		0		0		0
13	Daman & Diu		0		0		0
14	Jammu and Kashmir		0		0		0
15	Ladakh		0		0		0
16	Lakshadweep		0		0		0

Annexure - V(A)

State-wise Summary of Assessment units Improved or deteriorated from 2022 to 2023 assessment

State-Wise Summary Of Assessmet Units Improved Or Deteriorated From 2022 To 2023 Assessment							
S. No.	Name of States / Union Territories	Total Number of Asssessed Units	Number of Assessment Units Improved	Number of Assessment Units Deteriorated	Number of Assessment Units With No Change	Number of Assessment Units Newly formed or Previous Assessment Units Reorganized	Remarks
1	Andhra Pradesh	667	8	9	650	0	
2	Arunachal Pradesh	42	0	0	42	0	No change in Categorization of Assessment units. (In the year 2022, assessments were made taking district as the unit, however, in 2023, assessment units are Blocks. As all the Blocks have been categorised under safe category, there is no change in the categorisation in comparsion to previous year in which all Districts were categorised as Safe)
3	Assam	245	0	0	245	0	No change in Categorization of Assessment units. (In the year 2022, assessments werecarried out considering district as the unit, however, in 2023, assessment units are Blocks. It may be noted that Kamrup Urban district which consists of only one Block i.e Kamrup Urban (Block) has been categorised as Semi-Critical in 2023 which was also categorised as Semi-Critical in year 2022)
4	Bihar	535	9	6	520	0	
5	Chhattisgarh	146	4	0	142	0	
6	Delhi	34	3	3	28	0	
7	Goa	12	0	0	12	0	
8	Gujarat	252	5	3	244	0	
9	Haryana	143	0	2	141	0	
10	Himachal Pradesh	10	0	0	10	0	
11	Jharkhand	263	0	0	264	0	
12	Karnataka	234	17	1	216	0	
13	Kerala	152	0	3	149	0	
14	Madhya Pradesh	317	0	0	317	0	
15	Maharashtra	353	8	1	344		
16	Manipur	9	0	0	9	0	
17	Meghalaya	39	0	0	39	0	No change in Categorization of Assessment units. (In the year 2022, assessments were made taking district as the unit, however, in 2023, assessment units are Blocks. As all the Blocks have been categorised under safe category, there is no change in the categorisation in comparsion to previous year in which all Districts were categorised as Safe)
18	Mizoram	26	0	0	26	0	
19	Nagaland	52	0	0	52	0	No change in Categorization of Assessment units. (In the year 2022, assessments were made taking district as the unit, however, in 2023, assessment units are Blocks. As all the Blocks have been categorised under safe category, there is no change in the categorisation in comparsion to previous year in which all Districts were categorised as Safe)
20	Odisha	314	1	2	311	0	
21	Punjab	153	10	6	137	0	

State-Wise Summary Of Assessmet Units Improved Or Deteriorated From 2022 To 2023 Assessment							
S. No.	Name of States / Union Territories	Total Number of Asssessed Units	Number of Assessment Units Improved	Number of Assessment Units Deteriorated	Number of Assessment Units With No Change	Number of Assessment Units Newly formed or Previous Assessment Units Reorganized	Remarks
22	Rajasthan	302	9	5	288	0	
23	Sikkim	6	0	0	6	0	
24	Tamil Nadu	1202	75	72	1018	37	It may noted that in the year 2023, assessments have been made with Taluka as the assessment, however, for sake of comarison of improvement/deteoration status, comparsion has in respect of Firkas
25	Telangana	612	44	21	529	18	
26	Tripura	59	0	0	59	0	
27	Uttar Pradesh	836	12	4	820	0	
28	Uttarakhand	18	0	0	18		
29	West Bengal	345	21	2	322	0	
30	Andaman And Nicobar	9	0	0	9	0	No change in Categorization of Assessment units. The assessment for the year 2023 has been done with Block as the unit while the earlier assessment was done with islands as the unit. However, it may be noted that a total of 36 islands constitute the nine Blocks of the UT of A& N islands. Out of the 36 islands, one island falling in Nancowry Block is saline.
31	Chandigarh	1	0	0	1	0	
32	Dadra & Nagar Haveli	1	0	0	1	0	
	Daman & Diu	2	0	0	2	0	
33	Jammu And Kashmir	20	0	0	20	0	
34	Lakshadweep	5	0	0	5	0	No change in Categorization of Assessment units. The assessment for the year 2023 has been done with Block as the unit while the earlier assessment was done with islands as the unit. However, it may be noted that a total of 9 islands constitute the 5 Blocks in the UT of Lakshdweep. Out of the 9 islands, one island in Amini Block and one in Kavarati Block have been categorised as Semi-critical in both the assessments.
35	Puducherry	8	0	0	2	6	
36	Ladakh	18	0	0	18	0	No change in Categorization of Assessment units.The assessment for the year 2023 has been done with Block as the unit while the earlier assessment was done with Valleys as the unit of assesment.
	Grand Total	7442 *	226	140	7016	61	* In GWRA-2023 , the total number of assessment units in the country is 6553. For this annexure, in respect of Tamil Nadu 1202 Firkas has been compared.Accordingly,the total number of assessment units compared in the sheet is 7442 instead of 6553.

`Annexure - V(B)

Comparison of Categorization of assessment Units (2022 to 2023)

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
ANDHRA PRADESH									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Sri Sathya Sai**	Lepakshi	72.87	Semi Critical	**Sri Sathya Sai**	Lepakshi	69.51	Safe	**Improved**
2	**Ananthapuramu**	Yellanur	75.95	Semi Critical	**Ananthapuramu**	Yellanur	68.41	Safe	**Improved**
3	**Chittoor**	Nindra	90.73	Critical	**Chittoor**	Nindra	87.78	Semi Critical	**Improved**
4	**Chittoor**	Penumuru	72.63	Semi Critical	**Chittoor**	Penumuru	69.86	Safe	**Improved**
5	**Chittoor**	Srirangarajapuram	70.61	Semi Critical	**Chittoor**	Srirangarajapuram	65.77	Safe	**Improved**
6	**Chittoor**	Gudi Palle	91.26	Critical	**Chittoor**	Gudi Palle	72.66	Semi Critical	**Improved**
7	**Prakasam**	Markapur	77.49	Semi Critical	**Prakasam**	Markapur	66.08	Safe	**Improved**
8	**Annamayya**	Ramasamudram	75.58	Semi Critical	**Annamayya**	Ramasamudram	57.88	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
ANDHRA PRADESH									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Srikakulam**	Gara	38.00	Safe	**Srikakulam**	Gara	76.85	Semi Critical	**Deteriorated**
2	**Srikakulam**	Laveru	27.79	Safe	**Srikakulam**	Laveru	91.82	Critical	**Deteriorated**
3	**Srikakulam**	Ranastalam	46.25	Safe	**Srikakulam**	Ranastalam	128.11	Over Exploited	**Deteriorated**
4	**Sri Sathya Sai**	Amadagur	69.69	Safe	**Sri Sathya Sai**	Amadagur	70.30	Semi Critical	**Deteriorated**
5	**Sri Sathya Sai**	Nallacheruvu	68.29	Safe	**Sri Sathya Sai**	Nallacheruvu	70.70	Semi Critical	**Deteriorated**
6	**Y.S.R Kadapa**	Pulivendla	81.25	Semi Critical	**Y.S.R Kadapa**	Pulivendla	102.23	Over Exploited	**Deteriorated**
7	**Ananthapuramu**	Narpala	68.34	Safe	**Ananthapuramu**	Narpala	70.40	Semi Critical	**Deteriorated**
8	**Prakasam**	Cumbum	67.02	Safe	**Prakasam**	Cumbum	106.37	Over Exploited	**Deteriorated**
9	**Prakasam**	Racherla	92.73	Critical	**Prakasam**	Racherla	107.85	Over Exploited	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
BIHAR									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Bhojpur**	Koilwar	94.18	Critical	**Bhojpur**	Koilwar	84.08	Semi_Critical	**Improved**
2	**Nalanda**	Ekangarsarai	92.17	Critical	**Nalanda**	Ekangarsarai	84.47	Semi_Critical	**Improved**
3	**Nalanda**	Karai Parsarai	91.84	Critical	**Nalanda**	Karai Parsarai	87.60	Semi_Critical	**Improved**
4	**Patna**	Athmalgola	98.05	Critical	**Patna**	Athmalgola	88.07	Semi_Critical	**Improved**
5	**Patna**	Masaurhi	90.64	Critical	**Patna**	Masaurhi	80.62	Semi_Critical	**Improved**
6	**Patna**	Patna Sadar	73.29	Semi_Critical	**Patna**	Patna Sadar	67.66	Safe	**Improved**
7	**Vaishali**	Chehra Kalan	73.62	Semi_Critical	**Vaishali**	Chehra Kalan	69.66	Safe	**Improved**
8	**Vaishali**	Goraul	82.97	Semi_Critical	**Vaishali**	Goraul	65.51	Safe	**Improved**
9	**Vaishali**	Lalganj	76.09	Semi_Critical	**Vaishali**	Lalganj	69.83	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
BIHAR									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Gaya**	Gaya Sadar	55.91	Safe	**Gaya**	Gaya Sadar	78.20	Semi_Critical	**Deteriorated**
2	**Gaya**	Khizar Sarai	66.74	Safe	**Gaya**	Khizar Sarai	71.82	Semi_Critical	**Deteriorated**
3	**Gaya**	Tekari	67.63	Safe	**Gaya**	Tekari	70.12	Semi_Critical	**Deteriorated**
4	**Nalanda**	Asthawan	60.23	Safe	**Nalanda**	Asthawan	76.51	Semi_Critical	**Deteriorated**
5	**Nalanda**	Sarmera	68.21	Safe	**Nalanda**	Sarmera	74.38	Semi_Critical	**Deteriorated**
6	**Vaishali**	Bidupur	56.88	Safe	**Vaishali**	Bidupur	79.58	Semi_Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
CHHATISGARH									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Durg**	Patan	73.32	Semi_Critical	**Durg**	Patan	63.86	Safe	**Improved**
2	**Dhamtari**	Dhamtari	94.62	Critical	**Dhamtari**	Dhamtari	86.02	Semi_Critical	**Improved**
3	**Sakti**	Dabhara	78.77	Semi_Critical	**Sakti**	Dabhara	58.61	Safe	**Improved**
4	**Sakti**	Malkharoda	77.07	Semi_Critical	**Sakti**	Malkharoda	48.66	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
DELHI									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**South**	Hauz Khas	127.66	Over Exploited	**South**	Hauz Khas	99.82	Critical	**Improved**
2	**South West**	Dwarka	112.61	Over Exploited	**South West**	Dwarka	99.83	Critical	**Improved**
3	**South West**	Najafgarh	82.83	Semi_Critical	**South West**	Najafgarh	69.58	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
DELHI									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Central**	Kotwali	87.53	Semi Critical	**Central**	Kotwali	94.22	Critical	**Deteriorated**
2	**East**	Gandhi Nagar	87.49	Semi Critical	**East**	Gandhi Nagar	91.45	Critical	**Deteriorated**
3	**East**	Preet Vihar	87.08	Semi Critical	**East**	Preet Vihar	90.38	Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
GUJARAT									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Kheda**	Galteshwar	72.81	Semi_Critical	**Kheda**	Galteshwar	61.30	Safe	**Improved**
2	**Junagadh**	Bhesan	71.21	Semi_Critical	**Junagadh**	Bhesan	64.65	Safe	**Improved**
3	**Kachchh**	Mandvi	102.02	Over_Exploited	**Kachchh**	Mandvi	95.40	Critical	**Improved**
4	**Amreli**	Rajula	92.14	Critical	**Amreli**	Rajula	76.95	Semi_Critical	**Improved**
5	**Mahesana**	Jotana	0.00	salinity	**Mahesana**	Jotana	124.06	Over_Exploited	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
GUJARAT									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Ahmedabad**	Mandal	87.13	Semi Critical	**Ahmedabad**	Mandal	96.65	Critical	**Deteriorated**
2	**Rajkot**	Paddhari	69.82	Safe	**Rajkot**	Paddhari	70.23	Semi Critical	**Deteriorated**
3	**Rajkot**	Upleta	69.94	Safe	**Rajkot**	Upleta	70.15	Semi Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
HARYANA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Mewat**	Punahana	88.74	Semi_Critical	**Mewat**	Punahana	93.36	Critical	**Deteriorated**
2	**Mewat**	Indri	68.71	Safe	**Mewat**	Indri	71.04	Semi_Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
KARNATAKA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Chamarajanagara**	Chamarajanagara	116.45	Over_Exploited	**Chamarajanagara**	Chamarajanagara	99.08	Critical	**Improved**
2	**Chamarajanagara**	Yalandur	98.04	Critical	**Chamarajanagara**	Yalandur	88.15	Semi_Critical	**Improved**
3	**Vijayanagara**	Harapanahalli	112.56	Over_Exploited	**Vijayanagara**	Harapanahalli	99.32	Critical	**Improved**
4	**Davanagere**	Honnali	74.23	Semi_Critical	**Davanagere**	Honnali	69.14	Safe	**Improved**
5	**Mysuru**	Mysuru	79.44	Semi_Critical	**Mysuru**	Mysuru	64.69	Safe	**Improved**
6	**Ramanagara**	Magadi	103.13	Over_Exploited	**Ramanagara**	Magadi	98.44	Critical	**Improved**
7	**Vijayapura**	Basavan Bagewadi	81.44	Semi_Critical	**Vijayapura**	Basavan Bagewadi	32.29	Safe	**Improved**
8	**Vijayapura**	Chadachana	83.35	Semi_Critical	**Vijayapura**	Chadachana	55.34	Safe	**Improved**
9	**Vijayapura**	Kolhara	72.32	Semi_Critical	**Vijayapura**	Kolhara	43.69	Safe	**Improved**
10	**Vijayapura**	Nidagundi	91.47	Critical	**Vijayapura**	Nidagundi	73.84	Semi_Critical	**Improved**
11	**Vijayapura**	Tikota	87.40	Semi_Critical	**Vijayapura**	Tikota	54.98	Safe	**Improved**
12	**Gadag**	Rona	117.80	Over_Exploited	**Gadag**	Rona	90.72	critical	**Improved**
13	**Gadag**	Shirahatti	77.12	Semi_Critical	**Gadag**	Shirahatti	65.99	Safe	**Improved**
14	**Haveri**	Ranebennur	80.06	Semi_Critical	**Haveri**	Ranebennur	62.66	Safe	**Improved**
15	**Haveri**	Ratteehalli	91.13	Critical	**Haveri**	Ratteehalli	82.07	Semi_Critical	**Improved**
16	**Bagalkot**	Badami	112.20	Over_Exploited	**Bagalkot**	Badami	96.83	Critical	**Improved**
17	**Bagalkot**	Guledagudda	91.33	Critical	**Bagalkot**	Guledagudda	89.93	Semi_Critical	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
KARNATAKA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Bagalkot**	Ilkal	67.08	Safe	**Bagalkot**	Ilkal	74.31	Semi Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
KERALA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Thiruvananthapuram**	Varkala	69.94	Safe	**Thiruvananthapuram**	Varkala	70.55	Semi_Critical	**Deteriorated**
2	**Kozhikkode**	Kozhikode	69.82	Safe	**Kozhikkode**	Kozhikode	70.95	Semi_Critical	**Deteriorated**
3	**Kollam**	Sasthamkotta	69.92	Safe	**Kollam**	Sasthamkotta	71.11	Semi_Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
MAHARASHTRA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Buldhana**	Khamgaon	71.31	Semi Critical	**Buldhana**	Khamgaon	68.51	Safe	**Improved**
2	**Buldhana**	Lonar	70.19	Semi Critical	**Buldhana**	Lonar	64.80	Safe	**Improved**
3	**Satara**	Phaltan	70.63	Semi Critical	**Satara**	Phaltan	66.66	Safe	**Improved**
4	**Nashik**	Sinnar	100.32	Over Exploited	**Nashik**	Sinnar	98.19	Critical	**Improved**
5	**Nagpur**	Saoner	70.06	Semi Critical	**Nagpur**	Saoner	69.32	Safe	**Improved**
6	**Amravati**	Achlapur	100.88	Over Exploited	**Amravati**	Achlapur	96.73	critical	**Improved**
7	**Amravati**	Tiwsa	70.32	Semi Critical	**Amravati**	Tiwsa	67.32	Safe	**Improved**
8	**Wardha**	Karanja	72.84	Semi Critical	**Wardha**	Karanja	68.54	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
MAHARASHTRA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Jalgaon**	Muktainagar	68.51	Safe	**Jalgaon**	Muktainagar	74.11	Semi Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
ODISHA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Kendrapara**	Garadpur	73.9	Semi_Critical	**Kendrapara**	Garadpur	68.52	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
ODISHA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Jharsuguda**	Jharsuguda	67.8	Safe	**Jharsuguda**	Jharsuguda	72.55	Semi_Critical	**Deteriorated**
2	**Khurda**	Khurda	69.55	Safe	**Khurda**	Khurda	74.16	Semi_Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
PUNJAB									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Pathankot**	Gharota	70.81	Semi_Critical	**Pathankot**	Gharota	64.72	Safe	**Improved**
2	**SAS Nagar**	Kharar	114.52	Over_Exploited	**SAS Nagar**	Kharar	98.45	Critical	**Improved**
3	**Mansa**	Sardulgarh	87.58	Semi_Critical	**Mansa**	Sardulgarh	56.92	Safe	**Improved**
4	**Mansa**	Budhlada	99.91	Critical	**Mansa**	Budhlada	75.27	Semi_Critical	**Improved**
5	**Bathinda**	Sangat	72.35	Semi_Critical	**Bathinda**	Sangat	61.13	Safe	**Improved**
6	**Bathinda**	Talwandi Sabo	75.17	Semi_Critical	**Bathinda**	Talwandi Sabo	48.57	Safe	**Improved**
7	**Bathinda**	Bathinda	126.44	Over_Exploited	**Bathinda**	Bathinda	94.97	Critical	**Improved**
8	**Firozpur**	Guruhar Sahai	103.27	Over_Exploited	**Firozpur**	Guruhar Sahai	89.74	Semi_Critical	**Improved**
9	**Firozpur**	Makhu	98.9	Critical	**Firozpur**	Makhu	78.19	Semi_Critical	**Improved**
10	**Gurdaspur**	Dina Nagar	86.21	Semi_Critical	**Gurdaspur**	Dina Nagar	53.95	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
PUNJAB									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**SAS Nagar**	Majri	64.9	Safe	**SAS Nagar**	Majri	80.24	Semi_Critical	**Deteriorated**
2	**Hoshiarpur**	Hajipur	64.34	Safe	**Hoshiarpur**	Hajipur	79.97	Semi_Critical	**Deteriorated**
3	**Hoshiarpur**	Mahilpur	90.13	Critical	**Hoshiarpur**	Mahilpur	105.77	Over_Exploited	**Deteriorated**
4	**Hoshiarpur**	Mukerian	89.69	Semi_Critical	**Hoshiarpur**	Mukerian	102.96	Over_Exploited	**Deteriorated**
5	**SBS Nagar**	Balachaur	89.55	Semi_Critical	**SBS Nagar**	Balachaur	90.39	Critical	**Deteriorated**
6	**Gurdaspur**	Sri Hargobindpur	97.95	Critical	**Gurdaspur**	Sri Hargobindpur	100.69	Over_Exploited	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
RAJASTHAN									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Karauli**	Nadoti	90.73	Critical	**Karauli**	Nadoti	75.13	Semi_Critical	**Improved**
2	**Jalor**	Chitalwana	101.47	Over_Exploited	**Jalor**	Chitalwana	96.10	Critical	**Improved**
3	**Udaipur**	Sayra	100.42	Over_Exploited	**Udaipur**	Sayra	99.58	Critical	**Improved**
4	**Sirohi**	Pindwara	91.69	Critical	**Sirohi**	Pindwara	87.54	Semi_Critical	**Improved**
5	**Sirohi**	Sirohi	101.09	Over_Exploited	**Sirohi**	Sirohi	97.35	Critical	**Improved**
6	**Tonk**	Todaraisingh	74.00	Semi_Critical	**Tonk**	Todaraisingh	68.39	Safe	**Improved**
7	**Jodhpur**	Luni	93.36	Critical	**Jodhpur**	Luni	87.21	Semi_Critical	**Improved**
8	**Sikar**	Fatehpur	113.83	Over_Exploited	**Sikar**	Fatehpur	82.11	Semi_Critical	**Improved**
9	**Nagaur**	Makrana	103.04	Over_Exploited	**Nagaur**	Makrana	92.10	Critical	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
RAJASTHAN									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Bundi**	Bundi	98.88	Critical	**Bundi**	Bundi	100.42	Over_Exploited	**Deteriorated**
2	**Jodhpur**	Bap	89.49	Semi_Critical	**Jodhpur**	Bap	99.25	Critical	**Deteriorated**
3	**Jhalawar**	Bhawani Mandi	86.03	Semi_Critical	**Jhalawar**	Bhawani Mandi	93.18	Critical	**Deteriorated**
4	**Churu**	Churu	98.96	Critical	**Churu**	Churu	103.00	Over_Exploited	**Deteriorated**
5	**Hanumangarh**	Pilibanga	67.52	Safe	**Hanumangarh**	Pilibanga	71.55	Semi_Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
TAMIL NADU									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Coimbatore**	Thirumalayampalayam	92.49	Critical	**Coimbatore**	Thirumalayampalayam	79.54	Semi_Critical	**Improved**
2	**Cuddalore**	Kattumannarkoil	74.73	Semi_Critical	**Cuddalore**	Kattumannarkoil	53.39	Safe	**Improved**
3	**Cuddalore**	Kullanchavadi	83.65	Semi_Critical	**Cuddalore**	Kullanchavadi	56.47	Safe	**Improved**
4	**Cuddalore**	Udaiyarkudi	88.37	Semi_Critical	**Cuddalore**	Udaiyarkudi	66.63	Safe	**Improved**
5	**Dharmapuri**	Dharmapuri	71.88	Semi_Critical	**Dharmapuri**	Dharmapuri	62.41	Safe	**Improved**
6	**Dharmapuri**	Harur	83.11	Semi_Critical	**Dharmapuri**	Harur	69.23	Safe	**Improved**
7	**Dharmapuri**	Pauparapatty	94.26	critical	**Dharmapuri**	Pauparapatty	87.74	Semi_Critical	**Improved**
8	**Dindigul**	Dharmathupatti	106.61	Over_Exploited	**Dindigul**	Dharmathupatti	93.00	Critical	**Improved**
9	**Dindigul**	Natham	75.89	Semi_Critical	**Dindigul**	Natham	66.32	Safe	**Improved**
10	**Dindigul**	Oruthattu	102.41	Over_Exploited	**Dindigul**	Oruthattu	91.00	Critical	**Improved**
11	**Dindigul**	Pillaiyar Natham	97.87	Critical	**Dindigul**	Pillaiyar Natham	89.96	Semi_Critical	**Improved**
12	**Erode**	Erode West	87.04	Semi_Critical	**Erode**	Erode West	69.97	Safe	**Improved**
13	**Erode**	Kasipalayam	75.15	Semi_Critical	**Erode**	Kasipalayam	42.32	Safe	**Improved**
14	**Kancheepuram**	Kolapakkam	71.14	Semi_Critical	**Kancheepuram**	Kolapakkam	65.52	Safe	**Improved**
15	**Karur**	Pugalur	101.35	Over_Exploited	**Karur**	Pugalur	93.01	Critical	**Improved**
16	**Karur**	Velliannai	100.27	Over_Exploited	**Karur**	Velliannai	97.72	Critical	**Improved**
17	**Madurai**	Kokkulam	90.89	Critical	**Madurai**	Kokkulam	84.28	Semi_Critical	**Improved**
18	**Madurai**	Nagamalai Pudukottai	99.40	Critical	**Madurai**	Nagamalai Pudukottai	72.21	Semi_Critical	**Improved**
19	**Madurai**	Sedapatti	90.79	Critical	**Madurai**	Sedapatti	88.79	Semi_Critical	**Improved**
20	**Madurai**	Sholavandan	74.09	Semi_Critical	**Madurai**	Sholavandan	53.57	Safe	**Improved**
21	**Madurai**	Thanichayam	77.26	Semi_Critical	**Madurai**	Thanichayam	66.45	Safe	**Improved**
22	**Madurai**	Thenkarai	79.97	Semi_Critical	**Madurai**	Thenkarai	44.29	Safe	**Improved**
23	**Madurai**	Thirumangalam	86.98	Semi_Critical	**Madurai**	Thirumangalam	65.62	Safe	**Improved**
24	**Madurai**	Valandur	95.16	Critical	**Madurai**	Valandur	81.84	Semi_Critical	**Improved**
25	**Namakkal**	Jedarpalayam	97.01	Critical	**Namakkal**	Jedarpalayam	87.65	Semi_Critical	**Improved**
26	**Namakkal**	Pandamangalam	111.67	Over_Exploited	**Namakkal**	Pandamangalam	97.82	Critical	**Improved**
27	**Salem**	Karupur	98.17	Critical	**Salem**	Karupur	87.36	Semi_Critical	**Improved**
28	**Tenkasi**	Cuddalor(T)	94.11	Critical	**Tenkasi**	Cuddalor(T)	84.16	Semi_Critical	**Improved**
29	**Tenkasi**	Kallurani	93.92	Critical	**Tenkasi**	Kallurani	89.89	Semi_Critical	**Improved**
30	**Tenkasi**	Surandai	91.03	Critical	**Tenkasi**	Surandai	87.42	Semi_Critical	**Improved**
31	**Tenkasi**	Uthumalai	109.31	Over_Exploited	**Tenkasi**	Uthumalai	90.92	Critical	**Improved**
32	**Tenkasi**	Veerakeralampudur	72.10	Semi_Critical	**Tenkasi**	Veerakeralampudur	55.83	Safe	**Improved**
33	**Thanjavur**	Kurichi(T)	74.28	Semi_Critical	**Thanjavur**	Kurichi(T)	67.49	Safe	**Improved**
34	**Thanjavur**	Perambur(T)	76.58	Semi_Critical	**Thanjavur**	Perambur(T)	54.83	Safe	**Improved**
35	**Thanjavur**	Thambikkottai	92.74	Critical	**Thanjavur**	Thambikkottai	73.38	Semi_Critical	**Improved**
36	**Thanjavur**	Thekkur	73.00	Semi_Critical	**Thanjavur**	Thekkur	67.86	Safe	**Improved**
37	**Thanjavur**	Ulur	91.40	critical	**Thanjavur**	Ulur	88.53	Semi_Critical	**Improved**
38	**Theni**	Theni	82.92	Semi_Critical	**Theni**	Theni	65.50	Safe	**Improved**
39	**Theni**	Uthamapalayam	83.36	Semi_Critical	**Theni**	Uthamapalayam	68.25	Safe	**Improved**
40	**Thiruvarur**	Koothanallur	79.44	Semi_Critical	**Thiruvarur**	Koothanallur	18.57	Safe	**Improved**
41	**Thiruvarur**	Sannanallur	77.90	Semi_Critical	**Thiruvarur**	Sannanallur	49.85	Safe	**Improved**
42	**Thoothukudi**	Udangudi	97.67	Critical	**Thoothukudi**	Udangudi	86.62	Semi_Critical	**Improved**
43	**Tiruchirappalli**	Sirugambur	76.35	Semi_Critical	**Tiruchirappalli**	Sirugambur	64.81	Safe	**Improved**
44	**Tirunelveli**	Manur	74.34	Semi_Critical	**Tirunelveli**	Manur	68.43	Safe	**Improved**
45	**Tirunelveli**	Pazhavoor	93.88	Critical	**Tirunelveli**	Pazhavoor	83.01	Semi_Critical	**Improved**
46	**Tiruppur**	Avanashi East	98.61	Critical	**Tiruppur**	Avanashi East	82.25	Semi_Critical	**Improved**
47	**Tiruppur**	Perumanallur	92.46	Critical	**Tiruppur**	Perumanallur	86.70	Semi_Critical	**Improved**
48	**Tiruppur**	Pongalore	96.61	Critical	**Tiruppur**	Pongalore	78.15	Semi_Critical	**Improved**
49	**Tiruppur**	Tiruppur North	78.58	Semi_Critical	**Tiruppur**	Tiruppur North	60.92	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
TAMIL NADU									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
50	**Tiruppur**	Uhiyur	97.99	Critical	**Tiruppur**	Uhiyur	82.56	Semi_Critical	**Improved**
51	**Tiruppur**	Uthukkuli	95.73	Critical	**Tiruppur**	Uthukkuli	89.44	Semi_Critical	**Improved**
52	**Tiruvallur**	Kannigaiper	73.23	Semi_Critical	**Tiruvallur**	Kannigaiper	64.80	Safe	**Improved**
53	**Tiruvallur**	Manavur	70.51	Semi_Critical	**Tiruvallur**	Manavur	65.59	Safe	**Improved**
54	**Tiruvallur**	Morai	71.71	Semi_Critical	**Tiruvallur**	Morai	61.39	Safe	**Improved**
55	**Tiruvallur**	Velliyur	70.60	Semi_Critical	**Tiruvallur**	Velliyur	68.28	Safe	**Improved**
56	**Tiruvallur**	Vengathur	78.72	Semi_Critical	**Tiruvallur**	Vengathur	68.69	Safe	**Improved**
57	**Tiruvannamalai**	Annakavoor	74.77	Semi_Critical	**Tiruvannamalai**	Annakavoor	68.65	Safe	**Improved**
58	**Tiruvannamalai**	Devigapuram	85.00	Semi_Critical	**Tiruvannamalai**	Devigapuram	69.90	Safe	**Improved**
59	**Tiruvannamalai**	Kadaladi(T)	85.66	Semi_Critical	**Tiruvannamalai**	Kadaladi(T)	66.58	Safe	**Improved**
60	**Tiruvannamalai**	Kolappalur	95.23	Critical	**Tiruvannamalai**	Kolappalur	79.94	Semi_Critical	**Improved**
61	**Tiruvannamalai**	Mandakolathur	72.91	Semi_Critical	**Tiruvannamalai**	Mandakolathur	55.56	Safe	**Improved**
62	**Tiruvannamalai**	Mangalam(T)	109.58	Over_Exploited	**Tiruvannamalai**	Mangalam(T)	91.52	critical	**Improved**
63	**Tiruvannamalai**	Nedungunam	93.26	critical	**Tiruvannamalai**	Nedungunam	86.67	Semi_Critical	**Improved**
64	**Tiruvannamalai**	Tiruvannamalai(North)	73.17	Semi_Critical	**Tiruvannamalai**	Tiruvannamalai(North)	57.15	Safe	**Improved**
65	**Tiruvannamalai**	Tiruvannamalai(South)	76.39	Semi_Critical	**Tiruvannamalai**	Tiruvannamalai(South)	56.18	Safe	**Improved**
66	**Tiruvannamalai**	Veraiyur	83.08	Semi_Critical	**Tiruvannamalai**	Veraiyur	53.77	Safe	**Improved**
67	**Vellore**	Kaniyambadi	99.12	Critical	**Vellore**	Kaniyambadi	89.90	Semi_Critical	**Improved**
68	**Vellore**	Katpadi	75.86	Semi_Critical	**Vellore**	Katpadi	63.73	Safe	**Improved**
69	**Vellore**	Valathur(V)	122.22	Over_Exploited	**Vellore**	Valathur(V)	89.54	Semi_Critical	**Improved**
70	**Villupuram**	Brammadesam	106.73	Over_Exploited	**Villupuram**	Brammadesam	97.81	Critical	**Improved**
71	**Villupuram**	Mugaiyur	70.25	Semi_Critical	**Villupuram**	Mugaiyur	67.72	Safe	**Improved**
72	**Villupuram**	Sathampadi	92.85	Critical	**Villupuram**	Sathampadi	89.00	Semi_Critical	**Improved**
73	**Villupuram**	Tindivanam	72.95	Semi_Critical	**Villupuram**	Tindivanam	52.23	Safe	**Improved**
74	**Villupuram**	Vadasiruvalur	91.68	Critical	**Villupuram**	Vadasiruvalur	80.91	Semi_Critical	**Improved**
75	**Villupuram**	Villupuram	71.35	Semi_Critical	**Villupuram**	Villupuram	66.87	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
TAMIL NADU									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Tiruvannamalai**	Agarapalayam	64.89	Safe	**Tiruvannamalai**	Agarapalayam	79.09	Semi_Critical	**Deteriorated**
2	**Coimbatore**	Alanthurai	94.99	Critical	**Coimbatore**	Alanthurai	104.98	Over_Exploited	**Deteriorated**
3	**Ariyalur**	Andimadam	43.03	Safe	**Ariyalur**	Andimadam	82.62	Semi_Critical	**Deteriorated**
4	**Erode**	Arasur(E)	97.84	Critical	**Erode**	Arasur(E)	101.71	Over_Exploited	**Deteriorated**
5	**Tiruppur**	Avinashi West	98.15	Critical	**Tiruppur**	Avinashi West	116.03	Over_Exploited	**Deteriorated**
6	**Tiruvannamalai**	Chengam	95.62	Critical	**Tiruvannamalai**	Chengam	113.89	Over_Exploited	**Deteriorated**
7	**Thanjavur**	Chozhanmaligai	21.01	Safe	**Thanjavur**	Chozhanmaligai	70.14	Semi_Critical	**Deteriorated**
8	**Thanjavur**	Eachankottai	56.78	Safe	**Thanjavur**	Eachankottai	73.76	Semi_Critical	**Deteriorated**
9	**Namakkal**	Elachipalayam	80.88	Semi_Critical	**Namakkal**	Elachipalayam	92.45	Critical	**Deteriorated**
10	**Kallakurichchi**	Eraiyur(K)	87.77	Semi_Critical	**Kallakurichchi**	Eraiyur(K)	91.45	Critical	**Deteriorated**
11	**Tiruvannamalai**	Eraiyur(T)	96.00	Critical	**Tiruvannamalai**	Eraiyur(T)	107.50	Over_Exploited	**Deteriorated**
12	**Cuddalore**	Kadampuliyur	87.70	Semi_Critical	**Cuddalore**	Kadampuliyur	96.65	Critical	**Deteriorated**
13	**Kancheepuram**	Kaliyampoondi	69.73	Safe	**Kancheepuram**	Kaliyampoondi	71.92	Semi_Critical	**Deteriorated**
14	**Pudukkottai**	Kallakottai	30.02	Safe	**Pudukkottai**	Kallakottai	71.21	Semi_Critical	**Deteriorated**
15	**Kallakurichchi**	Kallakurichi	87.25	Semi_Critical	**Kallakurichchi**	Kallakurichi	91.87	Critical	**Deteriorated**
16	**Theni**	Kandamanur	90.75	Critical	**Theni**	Kandamanur	102.08	Over_Exploited	**Deteriorated**
17	**Pudukkottai**	Karaiyur	68.58	Safe	**Pudukkottai**	Karaiyur	70.06	Semi_Critical	**Deteriorated**
18	**Coimbatore**	Karamadai	86.01	Semi_Critical	**Coimbatore**	Karamadai	92.49	Critical	**Deteriorated**
19	**Pudukkottai**	Keeranur	55.91	Safe	**Pudukkottai**	Keeranur	73.43	Semi_Critical	**Deteriorated**
20	**Tiruvannamalai**	Kilpennathur	91.33	Critical	**Tiruvannamalai**	Kilpennathur	104.76	Over_Exploited	**Deteriorated**
21	**Salem**	Kolathur(S)	88.40	Semi_Critical	**Salem**	Kolathur(S)	95.51	Critical	**Deteriorated**
22	**Ariyalur**	Kovagam	50.42	Safe	**Ariyalur**	Kovagam	80.46	Semi_Critical	**Deteriorated**
23	**Dharmapuri**	Krishnapuram	89.76	Semi_Critical	**Dharmapuri**	Krishnapuram	92.34	Critical	**Deteriorated**
24	**Ariyalur**	Kundaveli	66.67	Safe	**Ariyalur**	Kundaveli	71.10	Semi_Critical	**Deteriorated**
25	**Tiruppur**	Madathukulam	49.55	Safe	**Tiruppur**	Madathukulam	71.70	Semi_Critical	**Deteriorated**
26	**Namakkal**	Manickampalayam	65.55	Safe	**Namakkal**	Manickampalayam	74.66	Semi_Critical	**Deteriorated**
27	**Theni**	Markayankottai	77.09	Semi_Critical	**Theni**	Markayankottai	96.71	Critical	**Deteriorated**
28	**Krishnagiri**	Mathigiri	69.52	Safe	**Krishnagiri**	Mathigiri	75.87	Semi_Critical	**Deteriorated**
29	**Pudukkottai**	Mathur	60.60	Safe	**Pudukkottai**	Mathur	75.06	Semi_Critical	**Deteriorated**
30	**Theni**	Myladumparai	73.75	Semi_Critical	**Theni**	Myladumparai	98.26	Critical	**Deteriorated**
31	**Kallakurichchi**	Nagalur	89.02	Semi_Critical	**Kallakurichchi**	Nagalur	90.84	Critical	**Deteriorated**
32	**Kallakurichchi**	Nainarpalayam	98.14	Critical	**Kallakurichchi**	Nainarpalayam	102.63	Over_Exploited	**Deteriorated**
33	**Pudukkottai**	Neerpalani	55.65	Safe	**Pudukkottai**	Neerpalani	72.61	Semi_Critical	**Deteriorated**
34	**Salem**	Pachamalai	86.59	Semi_Critical	**Salem**	Pachamalai	91.76	Critical	**Deteriorated**
35	**Salem**	Panamarathupatti	93.46	Critical	**Salem**	Panamarathupatti	110.75	Over_Exploited	**Deteriorated**
36	**Cuddalore**	Panruti	79.91	Semi_Critical	**Cuddalore**	Panruti	91.94	Critical	**Deteriorated**
37	**Tiruvannamalai**	Peranamallur	66.90	Safe	**Tiruvannamalai**	Peranamallur	70.53	Semi_Critical	**Deteriorated**
38	**Vellore**	Pernambut	88.32	Semi_Critical	**Vellore**	Pernambut	93.65	Critical	**Deteriorated**
39	**Krishnagiri**	Pochampalli	65.44	Safe	**Krishnagiri**	Pochampalli	80.70	Semi_Critical	**Deteriorated**
40	**Pudukkottai**	Poovathakudi	66.74	Safe	**Pudukkottai**	Poovathakudi	83.55	Semi_Critical	**Deteriorated**
41	**Salem**	Potanery	97.72	Critical	**Salem**	Potanery	125.18	Over_Exploited	**Deteriorated**
42	**Pudukkottai**	Pudhunagar	57.23	Safe	**Pudukkottai**	Pudhunagar	74.09	Semi_Critical	**Deteriorated**
43	**Pudukkottai**	Pudukkottai	49.92	Safe	**Pudukkottai**	Pudukkottai	74.15	Semi_Critical	**Deteriorated**
44	**Theni**	Rajathani	95.55	Critical	**Theni**	Rajathani	103.73	Over_Exploited	**Deteriorated**
45	**Cuddalore**	Rettichavadi	98.29	Critical	**Cuddalore**	Rettichavadi	101.77	Over_Exploited	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
TAMIL NADU									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
46	**Madurai**	Sakkimangalam	52.50	Safe	**Madurai**	Sakkimangalam	71.28	Semi_Critical	**Deteriorated**
47	**Kallakurichchi**	Sankarapuram	94.43	Critical	**Kallakurichchi**	Sankarapuram	103.94	Over_Exploited	**Deteriorated**
48	**Tiruvannamalai**	Santhavasal	82.22	Semi_Critical	**Tiruvannamalai**	Santhavasal	99.13	Critical	**Deteriorated**
49	**Ariyalur**	Sendurai(A)	75.58	Semi_Critical	**Ariyalur**	Sendurai(A)	93.23	Critical	**Deteriorated**
50	**Coimbatore**	Sulur	65.60	Safe	**Coimbatore**	Sulur	71.84	Semi_Critical	**Deteriorated**
51	**Erode**	Talavadi	50.03	Safe	**Erode**	Talavadi	71.07	Semi_Critical	**Deteriorated**
52	**Tiruvannamalai**	Thandarampet	82.06	Semi_Critical	**Tiruvannamalai**	Thandarampet	93.65	Critical	**Deteriorated**
53	**Tiruvannamalai**	Thanipadi	95.66	Critical	**Tiruvannamalai**	Thanipadi	116.69	Over_Exploited	**Deteriorated**
54	**Vellore**	Thiruvalam	67.97	Safe	**Vellore**	Thiruvalam	86.03	Semi_Critical	**Deteriorated**
55	**Cuddalore**	Thiruvanthipuram	94.05	Critical	**Cuddalore**	Thiruvanthipuram	102.77	Over_Exploited	**Deteriorated**
56	**Tiruppur**	Thungavi	54.17	Safe	**Tiruppur**	Thungavi	71.94	Semi_Critical	**Deteriorated**
57	**Tiruvannamalai**	Thurinjapuram	84.19	Semi_Critical	**Tiruvannamalai**	Thurinjapuram	95.76	Critical	**Deteriorated**
58	**Namakkal**	Tiruchengode	97.72	Critical	**Namakkal**	Tiruchengode	136.36	Over_Exploited	**Deteriorated**
59	**Kallakurichchi**	Tirukkoilur	56.53	Safe	**Kallakurichchi**	Tirukkoilur	77.04	Semi_Critical	**Deteriorated**
60	**Cuddalore**	Titagudi(East)	96.84	Critical	**Cuddalore**	Titagudi(East)	106.90	Over_Exploited	**Deteriorated**
61	**Cuddalore**	Titagudi(West)	88.86	Semi_Critical	**Cuddalore**	Titagudi(West)	90.77	Critical	**Deteriorated**
62	**Kallakurichchi**	Ulundurpet	72.12	Semi_Critical	**Kallakurichchi**	Ulundurpet	97.59	Critical	**Deteriorated**
63	**Tiruchirappalli**	Uppilliyapuram	99.43	Critical	**Tiruchirappalli**	Uppilliyapuram	109.52	Over_Exploited	**Deteriorated**
64	**Thiruvarur**	Vadapathimangalam	95.77	Critical	**Thiruvarur**	Vadapathimangalam	108.29	Over_Exploited	**Deteriorated**
65	**Coimbatore**	Vadavalli	4.51	Safe	**Coimbatore**	Vadavalli	73.46	Semi_Critical	**Deteriorated**
66	**Tiruvannamalai**	Vanapuram	75.47	Semi_Critical	**Tiruvannamalai**	Vanapuram	97.01	Critical	**Deteriorated**
67	**Pudukkottai**	Varappur(P)	46.14	Safe	**Pudukkottai**	Varappur(P)	72.07	Semi_Critical	**Deteriorated**
68	**Pudukkottai**	Veerappatti	66.93	Safe	**Pudukkottai**	Veerappatti	71.11	Semi_Critical	**Deteriorated**
69	**Cuddalore**	Veppur	82.59	Semi_Critical	**Cuddalore**	Veppur	98.09	Critical	**Deteriorated**
70	**Tiruvannamalai**	Vettavalam	84.60	Semi_Critical	**Tiruvannamalai**	Vettavalam	92.66	Critical	**Deteriorated**
71	**Villupuram**	Vikkiravandi	89.80	Semi_Critical	**Villupuram**	Vikkiravandi	94.20	Critical	**Deteriorated**
72	**Cuddalore**	Vridhachalam North	95.92	Critical	**Cuddalore**	Vridhachalam North	106.86	Over_Exploited	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
TELANGANA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Rangareddy**	Serilingampally	99.86	Critical	**Rangareddy**	Serilingampally	84.86	Semi_Critical	**Improved**
2	**Bhadradri Kothagudem**	Dammapeta	93.51	Critical	**Bhadradri Kothagudem**	Dammapeta	71.79	Semi_Critical	**Improved**
3	**Bhadradri Kothagudem**	Chunchupally	91.74	Critical	**Bhadradri Kothagudem**	Chunchupally	82.00	Semi_Critical	**Improved**
4	**Nagarkurnool**	Veldanda	98.38	Critical	**Nagarkurnool**	Veldanda	76.50	Semi_Critical	**Improved**
5	**Nizamabad**	Rudrur	97.23	Critical	**Nizamabad**	Rudrur	73.84	Semi_Critical	**Improved**
6	**Nizamabad**	Armur	91.75	Critical	**Nizamabad**	Armur	86.21	Semi_Critical	**Improved**
7	**Rangareddy**	Hayathnagar	141.92	Over_Exploited	**Rangareddy**	Hayathnagar	50.74	Safe	**Improved**
8	**Hyderabad**	Khairatabad	104.79	Over_Exploited	**Hyderabad**	Khairatabad	97.77	Critical	**Improved**
9	**Hyderabad**	Bahadurpura	137.70	Over_Exploited	**Hyderabad**	Bahadurpura	82.98	Semi_Critical	**Improved**
10	**Hyderabad**	Musheerabad	206.39	Over_Exploited	**Hyderabad**	Musheerabad	87.69	Semi_Critical	**Improved**
11	**Hyderabad**	Secunderabad	112.13	Over_Exploited	**Hyderabad**	Secunderabad	92.64	Critical	**Improved**
12	**Karimnagar**	Chigurumamidi	71.51	Semi_Critical	**Karimnagar**	Chigurumamidi	30.41	Safe	**Improved**
13	**Karimnagar**	Gangadhara	82.64	Semi_Critical	**Karimnagar**	Gangadhara	67.25	Safe	**Improved**
14	**Kamareddy**	Bhiknur	71.07	Semi_Critical	**Kamareddy**	Bhiknur	66.77	Safe	**Improved**
15	**Kamareddy**	Rajampet	70.32	Semi_Critical	**Kamareddy**	Rajampet	64.52	Safe	**Improved**
16	**Medak**	Nizampet	78.03	Semi_Critical	**Medak**	Nizampet	67.35	Safe	**Improved**
17	**Nirmal**	Nirmal_Rural	71.37	Semi_Critical	**Nirmal**	Nirmal_Rural	48.48	Safe	**Improved**
18	**Mahabubnagar**	Midjil	74.60	Semi_Critical	**Mahabubnagar**	Midjil	69.86	Safe	**Improved**
19	**Mahabubnagar**	Musapet	71.57	Semi_Critical	**Mahabubnagar**	Musapet	65.10	Safe	**Improved**
20	**Mahabubnagar**	Nawabpet	83.61	Semi_Critical	**Mahabubnagar**	Nawabpet	61.56	Safe	**Improved**
21	**Mahabubnagar**	Rajapur	70.52	Semi_Critical	**Mahabubnagar**	Rajapur	53.77	Safe	**Improved**
22	**Narayanpet**	Kosgi	79.51	Semi_Critical	**Narayanpet**	Kosgi	68.89	Safe	**Improved**
23	**Suryapet**	Thirumalagiri	71.20	Semi_Critical	**Suryapet**	Thirumalagiri	64.83	Safe	**Improved**
24	**Suryapet**	Maddirala	71.97	Semi_Critical	**Suryapet**	Maddirala	63.08	Safe	**Improved**
25	**Khammam**	Kusumanchi	71.74	Semi_Critical	**Khammam**	Kusumanchi	58.46	Safe	**Improved**
26	**Khammam**	Thirumalayapalem	78.80	Semi_Critical	**Khammam**	Thirumalayapalem	64.01	Safe	**Improved**
27	**Khammam**	Vemsoor	77.22	Semi_Critical	**Khammam**	Vemsoor	68.19	Safe	**Improved**
28	**Nalgonda**	Devarakonda	79.89	Semi_Critical	**Nalgonda**	Devarakonda	59.56	Safe	**Improved**
29	**Rangareddy**	Maheshwaram	70.14	Semi_Critical	**Rangareddy**	Maheshwaram	54.94	Safe	**Improved**
30	**Rangareddy**	Kothur	89.29	Semi_Critical	**Rangareddy**	Kothur	68.33	Safe	**Improved**
31	**Rangareddy**	Kadthal	72.59	Semi_Critical	**Rangareddy**	Kadthal	63.49	Safe	**Improved**
32	**Rangareddy**	Moinabad	72.26	Semi_Critical	**Rangareddy**	Moinabad	58.13	Safe	**Improved**
33	**Rangareddy**	Saroornagar	78.30	Semi_Critical	**Rangareddy**	Saroornagar	62.12	Safe	**Improved**
34	**Bhadradri Kothagudem**	Manuguru	87.82	Semi_Critical	**Bhadradri Kothagudem**	Manuguru	62.18	Safe	**Improved**
35	**Medchal Malkajgiri**	Medchel	73.00	Semi_Critical	**Medchal Malkajgiri**	Medchel	69.30	Safe	**Improved**
36	**Nagarkurnool**	Vangoor	74.38	Semi_Critical	**Nagarkurnool**	Vangoor	49.32	Safe	**Improved**
37	**Nagarkurnool**	Urkonda	73.52	Semi_Critical	**Nagarkurnool**	Urkonda	68.80	Safe	**Improved**
38	**Nizamabad**	Yergatla	71.89	Semi_Critical	**Nizamabad**	Yergatla	59.96	Safe	**Improved**
39	**Nizamabad**	Chandur	72.32	Semi_Critical	**Nizamabad**	Chandur	55.62	Safe	**Improved**
40	**Nizamabad**	Varni	75.08	Semi_Critical	**Nizamabad**	Varni	57.26	Safe	**Improved**
41	**Nizamabad**	Mugpal	72.91	Semi_Critical	**Nizamabad**	Mugpal	52.73	Safe	**Improved**
42	**Siddipet**	Markook	70.61	Semi_Critical	**Siddipet**	Markook	64.18	Safe	**Improved**
43	**Siddipet**	Siddipet_Urban	71.94	Semi_Critical	**Siddipet**	Siddipet_Urban	64.50	Safe	**Improved**
44	**Siddipet**	Maddur	76.09	Semi_Critical	**Siddipet**	Maddur	60.67	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
TELANGANA									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
45	**Karimnagar**	Ramadugu	61.35	Safe	**Karimnagar**	Ramadugu	73.28	Semi_Critical	**Deteriorated**
46	**Nalgonda**	Nampalle	69.44	Safe	**Nalgonda**	Nampalle	70.79	Semi_Critical	**Deteriorated**
47	**Nalgonda**	Chandur	65.08	Safe	**Nalgonda**	Chandur	76.68	Semi_Critical	**Deteriorated**
48	**Rangareddy**	Rajendranagar	59.66	Safe	**Rangareddy**	Rajendranagar	78.96	Semi_Critical	**Deteriorated**
49	**Rajanna Siricilla**	Chandurthi	69.95	Safe	**Rajanna Siricilla**	Chandurthi	74.71	Semi_Critical	**Deteriorated**
50	**Rajanna Siricilla**	Rudrangi	64.28	Safe	**Rajanna Siricilla**	Rudrangi	77.89	Semi_Critical	**Deteriorated**
51	**Hyderabad**	Amberpet	57.88	Safe	**Hyderabad**	Amberpet	97.44	Critical	**Deteriorated**
52	**Hyderabad**	Bandlaguda	64.96	Safe	**Hyderabad**	Bandlaguda	87.65	Semi_Critical	**Deteriorated**
53	**Hyderabad**	Shaikpet	59.53	Safe	**Hyderabad**	Shaikpet	95.45	Critical	**Deteriorated**
54	**Hyderabad**	Tirumalgiri	34.11	Safe	**Hyderabad**	Tirumalgiri	72.00	Semi_Critical	**Deteriorated**
55	**Sangareddy**	Ameenapur	67.17	Safe	**Sangareddy**	Ameenapur	75.54	Semi_Critical	**Deteriorated**
56	**Hanumakonda**	Khazipet	69.80	Safe	**Hanumakonda**	Khazipet	72.33	Semi_Critical	**Deteriorated**
57	**Yadadri Bhuvanagiri**	Alair	62.56	Safe	**Yadadri Bhuvanagiri**	Alair	70.65	Semi_Critical	**Deteriorated**
58	**Adilabad**	Mavala	88.22	Semi_Critical	**Adilabad**	Mavala	91.88	Critical	**Deteriorated**
59	**Hyderabad**	Ammerpet	70.10	Semi_Critical	**Hyderabad**	Ammerpet	106.58	Over Exploited	**Deteriorated**
60	**Hyderabad**	Maredpally	86.69	Semi_Critical	**Hyderabad**	Maredpally	90.42	Critical	**Deteriorated**
61	**Hyderabad**	Himayatnagar	85.50	Semi_Critical	**Hyderabad**	Himayatnagar	103.54	Over Exploited	**Deteriorated**
62	**Hyderabad**	Nampally	75.47	Semi_Critical	**Hyderabad**	Nampally	90.61	Critical	**Deteriorated**
63	**Medchal Malkajgiri**	Bachpalle	83.38	Semi_Critical	**Medchal Malkajgiri**	Bachpalle	100.03	Over Exploited	**Deteriorated**
64	**Sangareddy**	Patancheruvu	78.18	Semi_Critical	**Sangareddy**	Patancheruvu	97.54	Critical	**Deteriorated**
65	**Hanumakonda**	Bheemadevarapalle	89.44	Semi_Critical	**Hanumakonda**	Bheemadevarapalle	91.47	Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
UTTAR PRADESH									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Shamli**	Kandhala	102.13	Over_Exploited	**Shamli**	Kandhala	99.41	Critical	**Improved**
2	**Bagpat**	Baghpat	93.35	Critical	**Bagpat**	Baghpat	88.34	Semi_Critical	**Improved**
3	**Jaunpur**	Baksha	70.81	Semi_Critical	**Jaunpur**	Baksha	69.22	Safe	**Improved**
4	**Hathras**	Sikandra Rao	90.35	Critical	**Hathras**	Sikandra Rao	89.61	Semi_Critical	**Improved**
5	**Budaun**	Salarpur	70.71	Semi_Critical	**Budaun**	Salarpur	68.32	Safe	**Improved**
6	**Etah**	Jalesar	90.36	Critical	**Etah**	Jalesar	88.98	Semi_Critical	**Improved**
7	**Varanasi**	Pindra	90.64	Critical	**Varanasi**	Pindra	78.15	Semi_Critical	**Improved**
8	**Agra**	Jaitpur Kalan	95.38	Critical	**Agra**	Jaitpur Kalan	87.93	Semi_Critical	**Improved**
9	**Sonbhadra**	Nagawa	72.76	Semi_Critical	**Sonbhadra**	Nagawa	67.28	Safe	**Improved**
10	**Hamirpur**	Rath	71.52	Semi_Critical	**Hamirpur**	Rath	69.00	Safe	**Improved**
11	**Hamirpur**	Sarila	73.89	Semi_Critical	**Hamirpur**	Sarila	69.15	Safe	**Improved**
12	**Prayagraj**	Baharia	70.78	Semi_Critical	**Prayagraj**	Baharia	69.84	Safe	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
UTTAR PRADESH									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Budaun**	Samrer	69.99	Safe	**Budaun**	Samrer	72.88	Semi_Critical	**Deteriorated**
2	**Aligarh**	Gonda	69.90	Safe	**Aligarh**	Gonda	72.28	Semi_Critical	**Deteriorated**
3	**Meerut**	Sarurpur	68.39	Safe	**Meerut**	Sarurpur	70.55	Semi_Critical	**Deteriorated**
4	**Rampur**	Said Nagar	64.23	Safe	**Rampur**	Said Nagar	79.93	Semi_Critical	**Deteriorated**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
WEST BENGAL									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Improved									
1	**Purba Barddhaman**	Mangolkote	70.69	Semi_Critical	**Purba Barddhaman**	Mangolkote	67.31	Safe	**Improved**
2	**Purba Barddhaman**	Kalna-II	70.64	Semi_Critical	**Purba Barddhaman**	Kalna-II	68.80	Safe	**Improved**
3	**Purba Barddhaman**	Manteswar	91.37	Critical	**Purba Barddhaman**	Manteswar	85.04	Semi_Critical	**Improved**
4	**Murshidabad**	Hariharpara	71.64	Semi_Critical	**Murshidabad**	Hariharpara	64.08	Safe	**Improved**
5	**Murshidabad**	Berhampore	73.68	Semi_Critical	**Murshidabad**	Berhampore	68.73	Safe	**Improved**
6	**Murshidabad**	Beldanga-I	73.95	Semi_Critical	**Murshidabad**	Beldanga-I	68.69	Safe	**Improved**
7	**North 24 Parganas**	Gaighata	93.91	Critical	**North 24 Parganas**	Gaighata	84.39	Semi_Critical	**Improved**
8	**North 24 Parganas**	Habra-I	99.56	Critical	**North 24 Parganas**	Habra-I	89.20	Semi_Critical	**Improved**
9	**North 24 Parganas**	Bagda	98.31	Critical	**North 24 Parganas**	Bagda	87.41	Semi_Critical	**Improved**
10	**North 24 Parganas**	Swarupnagar	78.30	Semi_Critical	**North 24 Parganas**	Swarupnagar	67.71	Safe	**Improved**
11	**Malda**	Kaliachak-I	75.90	Semi_Critical	**Malda**	Kaliachak-I	68.50	Safe	**Improved**
12	**Paschim Barddhaman**	Raniganj	95.16	Critical	**Paschim Barddhaman**	Raniganj	88.32	Semi_Critical	**Improved**
13	**Haora**	Udaynarayanpur	74.44	Semi_Critical	**Haora**	Udaynarayanpur	35.99	Safe	**Improved**
14	**Dakshin Dinajpur**	Hilli	96.58	Critical	**Dakshin Dinajpur**	Hilli	82.64	Semi_Critical	**Improved**
15	**Dakshin Dinajpur**	Balurghat	72.32	Semi_Critical	**Dakshin Dinajpur**	Balurghat	64.32	Safe	**Improved**
16	**Nadia**	Karimpur-I	95.47	Critical	**Nadia**	Karimpur-I	82.25	Semi_Critical	**Improved**
17	**Nadia**	Nabadwip	98.70	Critical	**Nadia**	Nabadwip	82.86	Semi_Critical	**Improved**
18	**Birbhum**	Mayureswar-II	70.82	Semi_Critical	**Birbhum**	Mayureswar-II	67.96	Safe	**Improved**
19	**Paschim Medinipur**	Garbeta-I	95.63	Critical	**Paschim Medinipur**	Garbeta-I	81.55	Semi_Critical	**Improved**
20	**Paschim Medinipur**	Keshpur	73.09	Semi_Critical	**Paschim Medinipur**	Keshpur	64.81	Safe	**Improved**
21	**Paschim Medinipur**	Chandrakona-II	92.33	Critical	**Paschim Medinipur**	Chandrakona-II	83.03	Semi_Critical	**Improved**

COMPARISON OF CATEGORIZATION OF ASSESSMENT UNITS (2023 AND 2022)									
WEST BENGAL									
S. No	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2022	Categorization 2022	Name of District	Name of Assessment Unit	Stage of Ground Water Extraction (%) in 2023	Categorization 2023	Remark
Deteriorated									
1	**Murshidabad**	Raninagar-II	57.59	Safe	**Murshidabad**	Raninagar-II	74.18	Semi_Critical	**Deteriorated**
2	**Murshidabad**	Ragunathganj-I	37.77	Safe	**Murshidabad**	Ragunathganj-I	75.69	Semi_Critical	**Deteriorated**

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ABBREVIATIONS

ARDC	Agriculture Refinance and Development Corporation
CGWA	Central Ground Water Authority
CGWB	Central Ground Water Board
bcm	Billion cubic metre
CLEG	Central Level Expert Group for overall reassessment of ground water resource of the country
GEC-1997	Ground Water Resources Estimation Committee, 1997
GWRA- 2020	Ground Water Resources Assessment, 2020
GSDA	Ground Water Survey and Development Agency, Maharashtra
ham	Hectare metre
IMD	India Meteorological Department
LPA	Long Period Average
lps	Litres per second
m	Meter
m bgl	Meter below ground level
m ham	Million hectare metre
M.I.	Minor Irrigation
DOWR, RD & GR	Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti, Govt. of India
NABARD	National Bank for Agricultural and Rural Development
NAQUIM	National Aquifer Mapping & Management Programme
UT	Union Territory

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