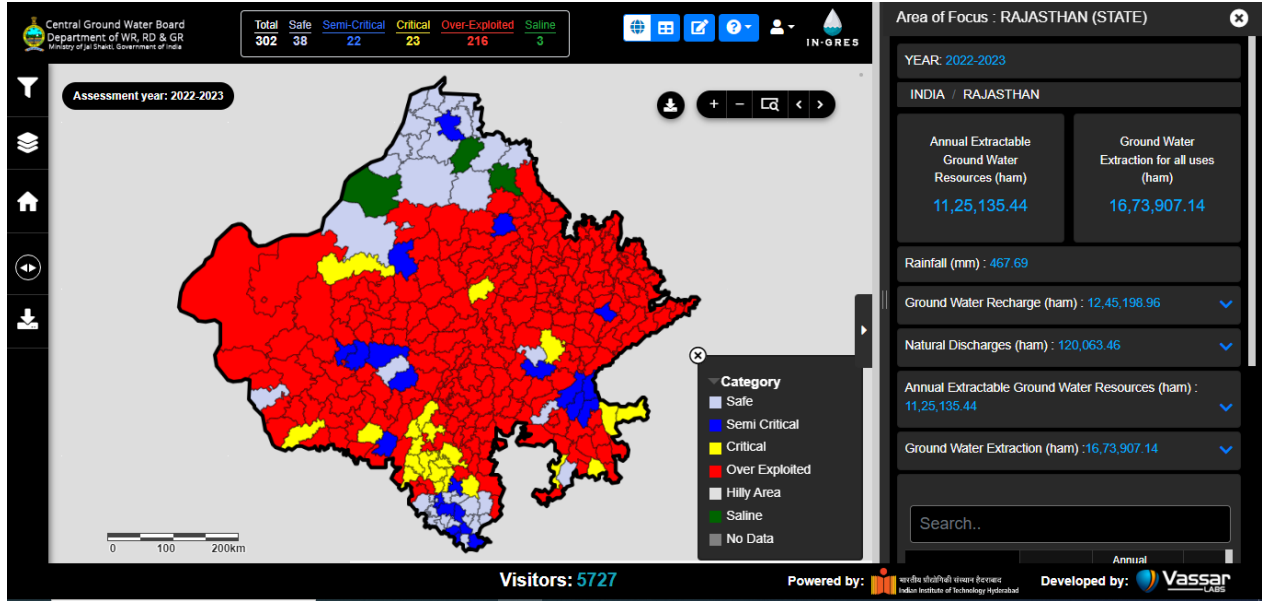




Report on Dynamic Ground Water Resources of Rajasthan (As on 31st March, 2023)



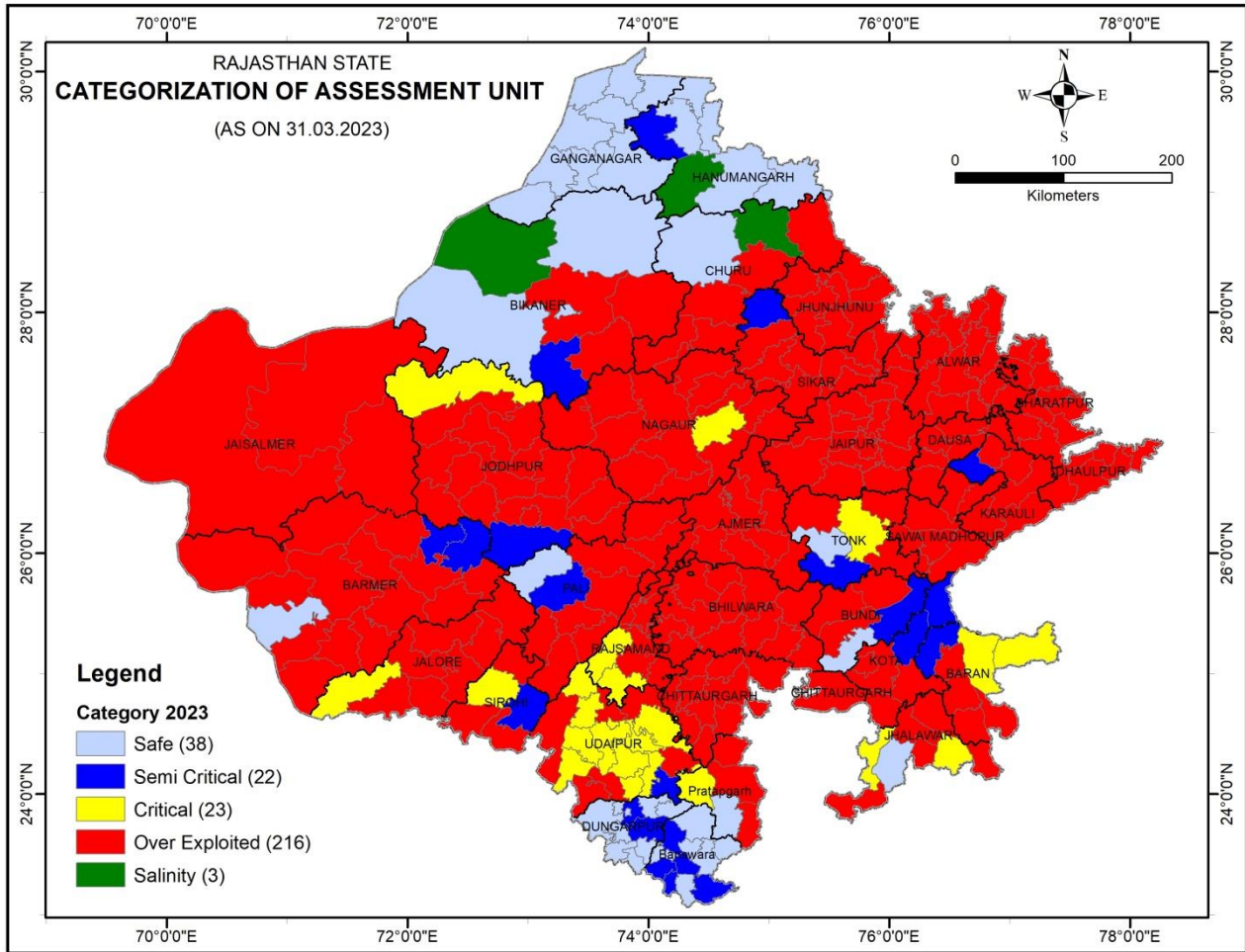
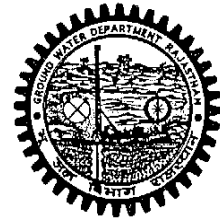
केंद्रीय भूमि जल बोर्ड
भारत सरकार
पश्चिमीक्षेत्र, जयपुर
Central Ground Water Board
Government of India
Western Region, Jaipur

भूजलविभाग
राजस्थान सरकार
जोधपुर
Ground Water Department
Government of Rajasthan
Jodhpur

January, 2024



Report on “Dynamic Ground Water Resources of Rajasthan As on 31.03.2023”



Prepared by

**Central Ground Water Board
Government of India
Western Region, Jaipur**

**Ground Water Department
Government of Rajasthan
Jodhpur**

**Jaipur
January, 2024**

Dr Subodh Agarwal, IAS
Additional Chief Secretary
PHED, WR & GWD



Ground Water Department
Government of Rajasthan
Jaipur

FOREWORD

Water is crucial to life on Earth. It is vital for the growth of economy and a critical component of ecology. Owing to its universal availability, easy access and low capital cost for extraction, ground water has become the most preferred source of fresh water for various uses in India. The ever increasing water demands have led to extraction of ground water in excess of its annual replenishment in several parts of the State. This has consequently, resulted in adverse environmental impacts including declining ground water levels and deterioration of its quality. Ground water acts as a buffer in times of drought and is a resilient resource for mitigating the effects of climate change. It needs to be managed judiciously to ensure its long term sustainability. A proper understanding of the status of availability and utilization of ground water resources is essential for its management. It is in this context that periodic assessment of ground water resources assumes significance. The report titled "Dynamic Groundwater Resources of Rajasthan, 2023" is a compilation of block-wise assessments, carried out jointly by CGWB and State Ground water Department under the supervision of State/UT level Committees; under the overall guidance of Central Level Expert Group. The dynamic groundwater resources of Rajasthan are assessed following the Groundwater Estimation Methodology, 2015 (GEC-2015). The database thus generated will have a significant role in planning and scientific management of ground water. I genuinely appreciate the work done by the officers of Central Ground Water Board and the State Ground Water Department for their efforts in completing the assessment by providing various input parameters required by the system. I am hopeful that this report will be very useful for the administrators, planners and ground water professionals and will be helpful in ensuring optimal utilization and sustainability of ground water resource.

A handwritten signature in blue ink, reading 'Subodh', with a horizontal line underneath it.

(Dr Subodh Agarwal)

Er.M.S.Rathore
Regional Director



Central Ground Water Board

Western Region
Deptt. of Water Resources, RD & GR
Ministry of Jal Shakti
Government of India
Jaipur

P R E F A C E

*Realistic assessment of the availability and utilization of a natural resource is vital for planning its sustainable development and judicious management. This is extremely important in the case of ground water in the state of Rajasthan, which is under increasing stress owing to its extraction for various uses. Assessment of Ground Water Resources of all the districts is being done jointly by State Ground Water Department and Central Ground Water Board periodically as per the GEC-2015 methodology recommended by the Ground Water Resource Estimation Committee constituted by the Govt. of India. This is a very important exercise, as it helps stakeholders to take effective measures for optimal utilization and management of ground water resources based on its criticality. Selection of areas for implementation of various schemes of State/Central Governments like. Atal Bhujal Yojana, MNRGAS, Ground Water regulation etc. is also broadly based on the outcome of such assessments. The report titled '**Dynamic Ground Water Resources of Rajasthan, 2023**' summarizes the results of the assessment, primarily in terms of resource availability, utilization and categorization of assessment units, compiled from the block wise assessments, duly approved by the State level Committee (SLC) and National Level Committee (NLC) constituted for the purpose. The report briefly describes salient features of ground water estimation methodology, rainfall distribution, hydrogeology and aquifer systems of Rajasthan and ground water level scenario of the state in the first five chapters before describing various components of the ground water resource assessment, 2023 in some detail. This is followed by details of block wise assessment of resources and conclusions drawn from the assessment. The report also has Annexures having block-wise information related to various components of the assessment. I wish to place on record my appreciation of the untiring efforts Smt. Preeti Pandey, Scientist-C and officers of Central Ground Water Board for liasoning with the State Government, compilation of data, calculation and validation of the resources. I am grateful to all the officers of Ground Water Department, Rajasthan for completing the challenging task of compiling this informative report. The team IIT Hyderabad and the software professionals of M/s Vassar Labs IT Solutions, Hyderabad, deserve praise for developing & customizing the IN-GRES web portal for the assessment as per requirements of Central Ground Water Board. We are thankful for the support extended by the district and circle level officers of the State Ground Water Department for providing necessary inputs and approvals in time. The guidance of Shri Satish Kumar, Chairman I/c, CGWB is gratefully acknowledged for improving the quality of the report as well as fast-track completion of the assessment. I truly believe that stakeholders at various levels will find this report informative and helpful for managing our precious ground water resources judiciously and for ensuring their sustainability for years to come. The efforts made by all officers/officials in bringing out this report are highly appreciated.*


(Er.M.S.Rathore)

Suraj Bhan Singh
Chief Engineer



Ground Water Department
Government of Rajasthan
Jaipur

MESSAGE

Groundwater is one of the sources to meet up the requirement for agriculture, domestic water supplies and industrial water needs. However the relative water scarcity and quality hazards of groundwater are being noticed in many parts of the country which need close monitoring in order to plan suitable management strategy.

Ground water is a replenishable each year and is the major source of water. The ground water development planning needs estimation of long term recharge. In this context historical records of ground water levels vis-a vis rainfall and other factors contributing to recharge assume paramount importance.

Ground water plays a vital role in sustainability of life for human settlement and agriculture economy. The ground water mainly occurs in weathered, fractured part of hard rock, in the pore spaces of sand and gravel, called alluvium formation and also in sedimentary formation – these is called aquifer as a whole.

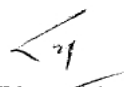
Rajasthan the largest state of India faces acute shortage of water resources due to arid climatic conditions, scanty rainfall and geomorphological setup. It has diverse rock types ranging from the oldest Archaean rocks to sub- Recent alluvium and has diverse hydrogeological setup.

There is a great need for the stakeholders coming from different setups of the society to understand the occurrence and availability of ground water for its better management and sustainability.

The Ground Water Resource Assessment is a very important exercise, as it helps stakeholders to take effective measures for optimal utilization and management of ground water resources in various schemes of State/Central Governments like Atal Bhujal Yojana, MNREGAS etc.

*The report titled '**Dynamic Ground Water Resources of Rajasthan, 2023**', a joint effort of Ground Water Department, Rajasthan and Central Ground Water Board describes the ground water resources of the State in terms of availability, utilization and categorization of assessment units.*

I extent my appreciation to all the officers of Ground Water Department, Rajasthan and Central Ground Water Board, Jaipur who have contributed directly or indirectly in compilation of the Resources and bringing out the results for the stakeholders in better management and development of the State.


(Suraj Bhan Singh)



**Dynamic Ground Water Resources of Rajasthan
(As on 31st March, 2023)**

Supervision: Er. M.S. Rathore, Regional Director, CGWB, WR, Jaipur

Shri P.K Tripathi, Regional Director, Artificial Recharge & PIB, CGWB, WR, Jaipur

Shri Suraj Bhan Singh, Chief Engineer, GWD, Govt. of Rajasthan

List of Contributors

(1) Central Ground Water Board, Western Region, Jaipur

Name	Designation	Assistance
<i>Smt. Preeti Pandey</i> Principal author	<i>Scientist-C</i>	<i>Liasoning with state agencies, data compilation, validation, assessmement, reasons for changes, report preparation, presentationand query reply before SLC and stake holders</i>
<i>Dr. R.K.Kushwaha</i>	<i>Scientist-E</i>	<i>Constant Support and guidance.</i>
<i>Sh. S.K. Pareek</i>	<i>Scientist-D</i>	<i>Guidance and providing Water Level data , expert supervision And presentation before SLC</i>
<i>Shri R. K. Verma</i>	<i>Scientist-D</i>	<i>Technical Assistance , correspondence and Liasoning with state Agencies</i>
<i>Ms. Nupur Pant</i>	<i>Scientist-B</i>	<i>Assisstance in data validation</i>
<i>Sh. Lokendra Kumar</i>	<i>Draftsman</i>	<i>Preparation of various Maps</i>
<i>Sh. S.C. Gupta</i>		

(2) Ground Water Department, Government of Rajasthan

Name	Designation	Assistance
<i>Shri Sunil Sharma</i>	<i>Superitending Hydrogeologist</i>	<i>Assistance as Nodal officer</i>
<i>Shri Rajesh Pareek</i>	<i>Senior Hydrogeologist</i>	<i>Validation of data</i>
<i>Shri Rishendra Singh</i>	<i>Senior Hydrogeologist</i>	
<i>Shri Mahendra Chouhan</i>	<i>Junior Hydrogeologist</i>	
<i>All the District Hydrogeologists and concerned senior/ Superintending Hydrogeologists</i>		<i>Data compilation and support in Assessment</i>

Constant Support in giving training for User Manual, data entry in IN-GRES software:

Dynamic Ground Water Resources of Rajasthan
As on 31st March 2023
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ABBREVIATION			
AAP	Annual Action Plan	Ham/ham	Hectare meter
MCM	Million Cubic Metres	ham/yr	Hectare meter per year
BW	Bore well	IMD	Indian Meteorological Department
TW	Tube well	Km	Kilometer
DW	Dug Well	m	metre
DCB	Dug cum Borewell	m bgl	meters below ground level
DTWL	Depth to Water Level	mm	Milli meter
EW	Exploratory Well	MP	Measuring Point
GL	Ground Level	m amsl	Metre above mean sea level
GEC	Ground water Estimation Committee	NA	Not Available
CGWB	Central Ground Water Board	Fig.	Figure
Rif	Rainfall Infiltration Factor	No.	Number
lpd	Litres per day	AD	Anno Domini
Sp.yield	Specific Yield	mg/l	milligram/litre
OE	Over-exploited	SC	Semi-critical
C	Critical	GW	Ground Water

कार्यकारी सारांश

राज्य स्तर पर भूजल आंकलन राज्य स्तरीय समिति के मार्गदर्शन और केंद्रीय स्तर के विशेषज्ञ समूह के समग्र पर्यवेक्षण के तहत राज्य भूजल विभाग और केंद्रीय भूजल बोर्ड द्वारा संयुक्त रूप से समय-समय पर भूजल संसाधन मूल्यांकन किये जाते हैं। इस तरह के संयुक्त अभ्यास इससे पहले 1980, 1995, 2004, 2009, 2011, 2013, 2017, 2020 और 2022 में किए जा चुके हैं।

मूल्यांकन में गतिशील भूजल संसाधनों या वार्षिक निकालने योग्य भूजल संसाधनों की गणना, कुल वर्तमान वार्षिक भूजल निष्कर्षण, उपयोग और वार्षिक निकालने योग्य संसाधनों, भूजल निकासी का स्तर के संबंध में उपयोग का प्रतिशत शामिल है। मूल्यांकन इकाइयों को भूजल निष्कर्षण के चरण के आधार पर वर्गीकृत किया जाता है, जिन्हें बाद में दीर्घकालीन जल स्तर के रुझानों के साथ सत्यापित किया जाता है। वर्ष 2017 से पहले के आकलन "भूजल आकलन समिति-(जीईसी)(की 1997 पद्धति का पालन करते हुए किया गया था, जबकि 2020 तथा 2022 के साथ-साथ वर्तमान मूल्यांकन जीईसी 2015 की कार्यप्रणाली के मापदंडों और दिशानिर्देशों पर आधारित है। पुनःपूर्ति योग्य भूजल संसाधनों का मुख्य स्रोत वर्षा से पुनर्भरण है, जो कुल वार्षिक भूजल पुनर्भरण में लगभग 74% योगदान देता है। राज्य के पूर्वी और पश्चिमी भागों में उच्च स्थानिक भिन्नता के साथ, राजस्थान में सालाना औसतन लगभग 58 सेमी बारिश होती है। राज्य के एक बड़े हिस्से में मुख्य रूप से जून से सितंबर के महीनों में फैले मानसून के मौसम के दौरान वर्षा होती है। वार्षिक वर्षा का 75% से अधिक केवल जून से सितंबर के चार बरसाती महीनों में प्राप्त होता है। वहाँ लौकिक पैमाने पर बड़े बदलाव के लिए अग्रणी। औसत वार्षिक वर्षा 580 मीमी है, लेकिन इसमें बड़ी स्थानिक विविधताएँ हैं। पश्चिमी राजस्थान में 400 मीमी से कम वर्षा होती है। सामान्य तौर पर पश्चिम की ओर वर्षा कम हो जाती है। रॉक संरचनाओं के प्रकार और उनके भंडारण और संचरण विशेषताओं का भूजल पुनर्भरण पर महत्वपूर्ण प्रभाव पड़ता है।

वर्तमान मूल्यांकन में कुल वार्षिक भूजल पुनर्भरण 12.45 बीसीएम आंका गया है। प्राकृतिक निर्वहन के लिए आवंटन रखते हुए वार्षिक निकालने योग्य भूजल संसाधन 11.25 बीसीएम उपलब्ध है। कुल वार्षिक भूजल निकासी 2023 तक 16.73 बीसीएम आंकी गई है। पूरे राज्य के लिए भूजल निकासी का औसत चरण लगभग 148.77 % है।

राज्य के अलग अलग भागों में विभिन्न उपयोगों के लिए भूजल की निकासी एक समान नहीं है। वर्ष 2022 की तरह 2023 में भी राज्य में कुल 302 मूल्यांकन इकाइयों में से 295 मूल्यांकन इकाइयों के अलावा सात नई शहरी मूल्यांकन इकाइयों को शामिल किया गया है। विभिन्न जिलों में 216 इकाइयों (71.52%) को 'अति-दोहित' के रूप में वर्गीकृत किया गया है जो अत्याधिक भूजल निकासी >100% को दर्शाता है। कुल 23 (7.62%) मूल्यांकन इकाइयों को 'संवेदशील' के रूप में वर्गीकृत किया गया है, जहां भूजल निकासी का स्तर 90-100% के बीच है। 22 "अर्ध संवेदशील" इकाइयां (7.28%) हैं, जहां भूजल निकासी का स्तर 70% और 90% के बीच है और 38 (12.58%) आकलन इकाइयों को 'सुरक्षित' के रूप में वर्गीकृत किया गया है, जहां भूजल निकासी का स्तर 70% से कम है। इसके अलावा, 3 मूल्यांकन इकाइयाँ (0.99%) हैं, जिन्हें 'खारा' के रूप में वर्गीकृत किया गया है, क्योंकि जलभृतों में भूजल का प्रमुख भाग खारा है। इसी प्रकार राज्य के 3.17 लाख वर्ग किमी रिचार्ज योग्य क्षेत्र में से 2.27 लाख वर्ग किमी (71.32%) 'अति-दोहित' के अंतर्गत हैं, 0.166 लाख वर्ग किमी (5.25%) 'संवेदशील' के अंतर्गत

हैं, 0.187 लाख वर्ग किमी (5.89%) "अर्ध संवेदंशील" के तहत हैं, 0.46 लाख वर्ग किमी (14.72%) 'सुरक्षित' के तहत हैं और 0.089 लाख वर्ग किमी (2.82%) 'सलाइन' या "खारा" श्रेणी मूल्यांकन इकाइयों के तहत हैं। राज्य के कुल वार्षिक निकालने योग्य संसाधनों के 10.95 बीसीएम में से, 8.2 बीसीएम (74.85%) 'अति-दोहित' के तहत हैं, 0.72 बीसीएम (6.58%) "संवेदंशील" के तहत हैं, 0.85 बीसीएम (7.76%) "अर्ध संवेदंशील" के तहत हैं। क्रिटिकल, 1.184 बीसीएम (10.8%) 'सुरक्षित' श्रेणी के मूल्यांकन इकाइयों के अंतर्गत हैं।

2022 के अनुमान की तुलना में साल 2023 में वार्षिक निकालने योग्य भूजल संसाधन में 10.96 से 11.25 बीसीएम की वृद्धि आई है। वार्षिक भूजल निकासी और भूजल निष्कर्षण का चरण 16.55 बीसीएम से 16.74 बीसीएम तक कि बढ़ोतरी है। भूजल निकासी का स्तर 151.07% से घटकर 148.77 % हो गया है। वार्षिक भूजल पुनर्भरण और सिंचाई के तहत क्षेत्र (सतह जल और भूजल दोनों द्वारा) के लिए वर्षा के आंकड़ों में परिवर्तन के कारण है। वार्षिक भू-जल निकासी में मामूली बदलाव कुओं की गणना के आंकड़ों में संशोधन और सिंचित भूमि क्षेत्र में बदलाव के कारण हुआ है। भूजल की अंधाधुंध निकासी से राज्य में अत्यधिक दोहन हो रहा है, जहां शुष्क जलवायु के कारण भूजल पुनर्भरण सीमित है, जिससे मौजूदा संसाधनों पर दबाव बढ़ रहा है। सरकार और निजी पहल के माध्यम से वर्षा जल संचयन, कृत्रिम पुनर्भरण योजनाओं और भूजल वृद्धि और संरक्षण उपायों जैसे प्रबंधन प्रथाओं के प्रयासों को लागू करने की आवश्यकता है जिसके परिणामस्वरूप भूजल की स्थिति में सुधार होगा। भूजल संसाधन मूल्यांकन, विज्ञान के अन्य क्षेत्रों की तरह, निरंतर शोध की आवश्यकता है।

Executive Summary

Ground Water Resources Assessment is carried out at periodical intervals jointly by State Ground Water Department and Central Ground Water Board under the guidance of the State Level Committee on Ground Water Assessment at State Levels and under the overall supervision of the Central Level Expert Group. Such joint exercises have been taken up earlier in 1980, 1995, 2004, 2009, 2011, 2013, 2017, 2020 and 2022.

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 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 2020, 2022 as well as the present 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 72 % of the total annual ground water recharge. Rajasthan receives about 58 cm of rain annually on average, with high spatial variation in eastern and western parts of the state. A major part of the state receives rainfall mainly during SW Monsoon season spread over the months of June to September. Over 75 % of the annual rainfall is received in the four rainy months for June to September only. There by leading to large variations on temporal scale. The average annual rainfall is 58 cm, but it has great spatial variations. Western Rajasthan receives rainfall less than 40 cm. In general, rainfall decreases westwards. Type of rock formations and their storage and transmission characteristics have a significant influence on ground water recharge.

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 16.73 bcm and the Stage of ground water extraction in the state is 148.77 %.

In the year 2022, 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), 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 12.42 bcm and from 10.96 bcm to 11.25 bcm respectively. Annual ground water extraction has increases slightly from 16.55 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 data for recharge and area under irrigation (both by surface water and ground water). The marginal change in annual ground water extraction is due to revision of well census data and change in irrigated land area.

The indiscriminate withdrawals of ground water leading to over-exploitation in the state where due to arid climate, groundwater recharge is limited, leading to stress on the resource. There is a need of applying efforts of rain water harvesting, artificial recharge plans and management practices like ground water augmentation and conservation measures through government and private initiatives that will result in improvement in ground water situation. Ground water resources assessment, like other fields of science, requires continuous refinement

Dynamic Ground Water Resources of Rajasthan As on 31st March 2023

Introduction

The Government of India vide Resolution No. T-13014/1/2019-GW Section dated 08/02/2022 from Director(GW Ministry of Jal Shakti, Department of Water Resources, River development & Ganga Rejuvenation) for constitution of Central Level Expert Group for overall re-assessment of ground water resources of the country (As on 31.03.2023). With this view, the said Committee with respect to Rajasthan state was constituted vide letter No. 6 (31) AR/Gr.3/2020 dated 04.07.2023 (Annexure I) of Deputy Secretary to Government vide order of Rajasthan Government Administrative Reforms (Group-3) Department with the following members

1	The Principal Secretary to Government, Ground Water Department & PHED	Chairman
2	Principal Secretary to Government, Energy	Member
3	Commissioner, Industries	Member
4	Commissioner, Agriculture	Member
5	Chief Engineer, SWRPD	Member
6	The Chief Engineer, Water Resources	Member
7	Chief Engineer (HQ), PHED	Member
8	Chief Engineer (Rural). PHED	Member
9	Chief Engineer, GWD	Member
10	Director, Department of Mines & Geology	Member
11	General Manager, NABARD	Member
12	Regional Director, Central Ground Water Board, Western Region, Jaipur	Member-Secretary

The terms of reference of the Group were as follows: -

- I. To estimate annual Replenishable ground water resources of the state in accordance with the Ground Water Resources Estimation Methodology – 2015 of CGWB.
- II. To estimate the status of utilization of the Annual Replenishable ground water resources

Ground Water Resource Estimation for the State is carried out periodically. The Ground Water Resources of Rajasthan were last estimated as on 31.03.2022. In the present report, block-wise dynamic ground water resources as on 31.3.2023 have been assessed. Ground Water Resources have been estimated as per the Ground Water Estimation Committee-2015 guidelines.

Administrative map of Rajasthan depicting the assessment units (Blocks) in each district (33) is represented in **Plate-I**

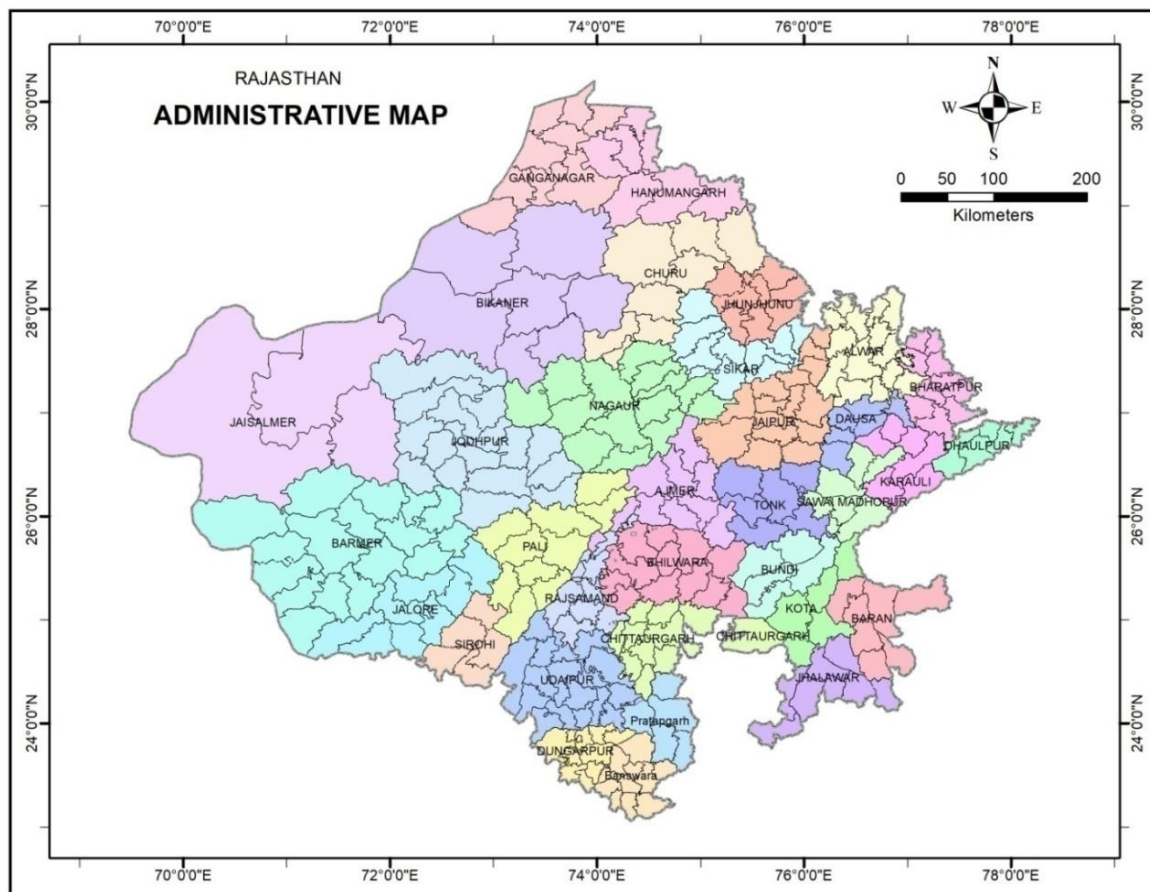


Plate-I. Administrative Map of Rajasthan showing Assessment Units

General Features of the State

2.1 Physiographic Features

2.1.1 Topography

Physiographically the state can be divided into four units:

- (a) Aravalli hill ranges
- (b) Eastern plains
- (c) Western Sandy Plain with Sand Dunes and
- (d) Vindhyan Scarp land and Deccan Lava Plateau

Physiography Map of Rajasthan is depicted in Plate-II

2.1.2 Aravalli Hill Ranges

The Aravalli ranges trending NE -SW are the oldest mountain chain in India. The elevation of these hill ranges varies from about 600 meters to over 900 meters above mean sea level m.amsl They are composed of Bhilwara, Aravalli and Delhi Super Group of rocks ranging in age from Archaean {2500 million years (my)} to Proterozoic (740 my). These ranges form a series of rugged hills with rounded surfaces. The quartzite stands out as scarps. Near Ajmer, these separate out south-westwards into a number of parallel ridges. At Mount Abu, the clusters of granite peaks reach a maximum height of 1722 m amsl at Guru Sikhar.

2.1.3 The Eastern Plains

In the plains, east of the Aravalli ranges, the altitude varies from 150 m to 450m AMSL. The general trend of the slope varies from place to place. In Dungarpur and Banswara districts the trend is mainly from north to south, in Alwar district it is from south to north and in the remaining districts, forming the central and north eastern Rajasthan, it is from west to east. The south-eastern limit is marked by the Vindhyan plateau.

2.1.4. The Western Sandy Plains and Sand Dunes

The sandy plains in western Rajasthan, forming a part of Thar-Desert, are mainly occupied by alluvium and blown sands. These plains are further sub-divided into three units:

Sandy Arid Plain (Marusthali)

- ii) Semi-arid Transitional Plain
- iii) Ghaggar Plain

The Sandy Arid Plain is a typical desert terrain. It includes the western most districts of Jaisalmer, Bikaner and parts of Barmer, Jodhpur, Nagaur, Churu and Ganganagar. The line dividing the Sandy Arid Plain and the Semi-arid Transitional Plain as well as Ghaggar Plain is based on climatic parameters and water resource availability.

The eastern boundary of the Semi-arid Transitional Plain is marked by the foot-hills and their extension on the western side of Aravalli ranges. Sand dunes are prominent and the terrain is punctuated with isolated hills of granites and rhyolites. The altitude varies from 30m to 300m amsl. The general slope is from northeast to southwest.

The Ghaggar Plain consists mainly of former flood plains of River Ghaggar and aeolian deposits. A network of canals covers the entire area. The southern and south-eastern part is occupied by medium to high dunes. Nineteen of these interdunal depressions are being utilised for storing the diverted Ghaggar flood waters. The central part of the Ghaggar Plain is drained by the regulated floodwaters of Ghaggar River.

2.1.5 Vindhyan Scarpland and Deccan Lava Plateau

The southeastern plains are locally characterized by plateau, scarp land and ravines. The Vindhyan scarp lands are seen all along the Great Boundary Fault from Chittorgarh to the trijunction of Bharatpur, Dholpur and SawaiMadhopur districts. They have an average elevation of 300 m to 580 m amsl.

The Deccan Lava Plateau is mainly confined to parts of Kota, Jhalawar, Banswara and Chittorgarh districts. The elevation ranges from 300m to over 500m amsl.

The ravines, locally impassable, are confined to the alluvium overlying the Vindhyans in Dholpur, Sawai Madhopur, Jhalawar and Kota districts along the Chambal River and its tributaries.

2.2 Drainage

The Aravalli Hill Ranges from the main water divide in Rajasthan. Luni is the only river west of Aravalli's. In the remaining area of western Rajasthan comprising about 60% of the geographical area of the state, the drainage is internal, and the streams are lost in the desert sands after flowing for a short distance from the point of origin. Luni itself essentially is an ephemeral stream with flood cycle of 16 years. Drainage in western Rajasthan is towards west and south - west.

In the east of Aravalli ranges, the main drainage is towards north - east. The Chambal Catchment occupies 21% (72,032 sq km) of the total geographical area of the state.

The other important catchments include Yamuna-Ganga in the north east, and Mahi and Sabarmati in the south west with flow towards south. The former three catchments support perennial rivers. In the northern and north-eastern parts of eastern Rajasthan, the Banganga, Barah, Sota, Sahibi and Kantli rivers are of inland nature. The drainage in the whole of Rajasthan is generally dendritic.

In the desert area, a few salt lakes and depressions exist, prominent among them being the Sambhar Lake, Didwana Lake, Bap, Pachpadra and Rann of Jaisalmer and Pokran.

2.3 Climate

Climatically, the year in Rajasthan can be divided into three major conventional seasons as follows:

The Hot- Weather Season (March to end of June)

Monsoon Season (End of June to September)

The Cold- Weather Season (October to February)

The India Meteorological Department has further sub-divided the cold season into two divisions, i.e.

The Season of retreating monsoon (October to December)

The cold season (January to February)

These seasonal variations have been broadly based on temperature and rainfall conditions in different months.

2.3.1. Rainfall

Rainfall is the major source of ground water recharge in the state. The long-term normal annual rainfall in the State ranges from 158.6 mm to 895.3 mm as shown in **Plate-III**. The state receives more than 90 % rainfall from southwest monsoon from June to September. The winter rainfall is meager. The average annual rainfall and departures from normal annual rainfall have been worked out shown as **Plate-IV**. Rainfall is the major contributor of Ground water Recharge in Rajasthan. (Depth to water level maps before and after monsoon is given in **Plate. -VII** and **Plate-VIII. 6** respectively).

The average annual rainfall of the state during the period 2021-22 was 735 mm. The percentage departures of average annual rainfall from normal annual rainfall (1901-70) have been computed for the last five years and tabulated in **Table 1**. It is observed that the average annual rainfall in the state, during the year 2018-19 was almost excess to normal with departure of 29.5%, normal during 2019-20. The average annual rainfall in the state during the 2017-18 was deficient with negative departure value of 12.6%.

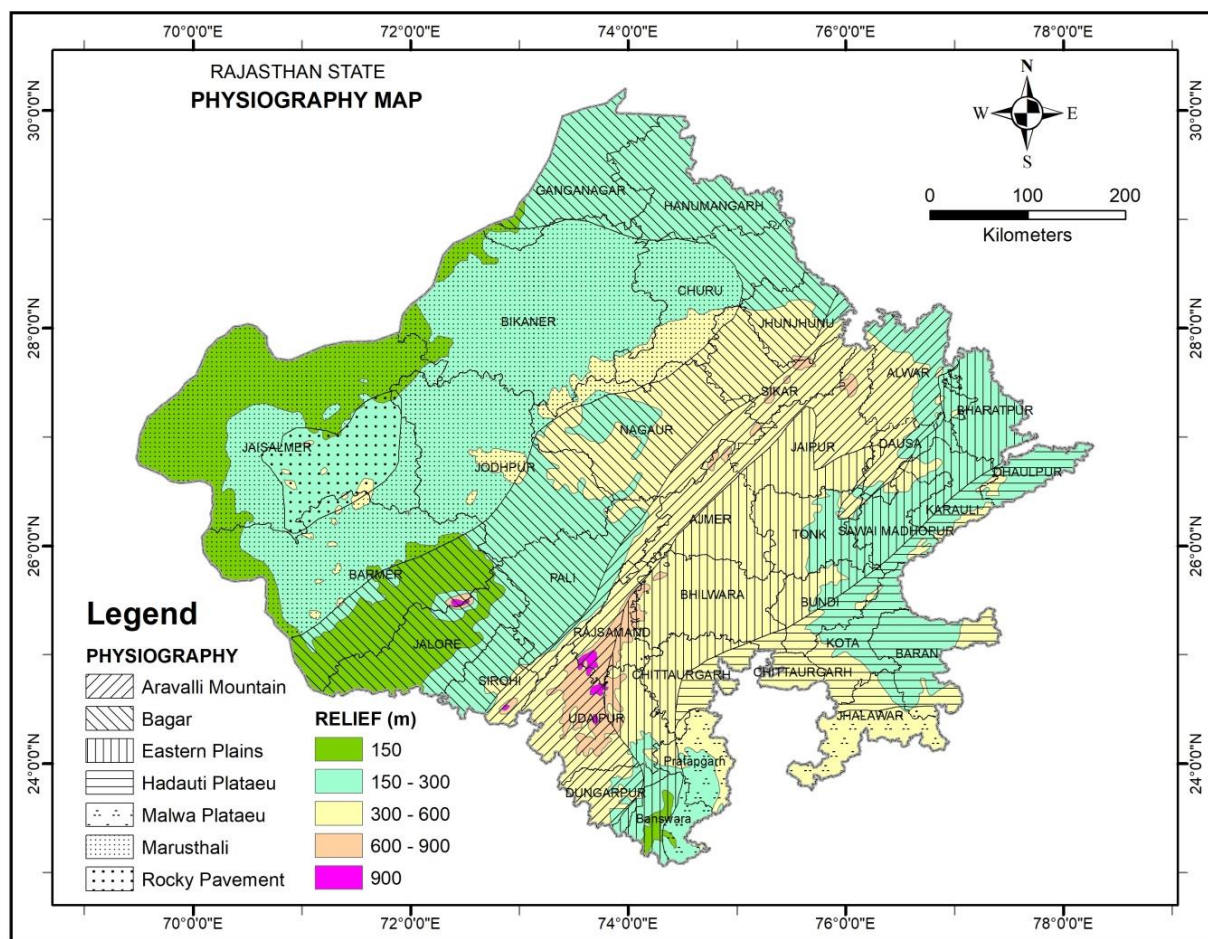


Plate-II: Physiography Map of Rajasthan

A perusal of Table 1 reveals that 11 districts of the state received excess rainfall, 15 districts received normal rainfall, and 7 districts received deficient rainfall than annual normal rainfall during the year 2021-22. It is observed that only one district (Ganganagar) of Rajasthan have received good rainfall with positive departures being more than 50%. While 3 districts have *v.i.z.* Bundi, Dhoulpur and Kota have received deficient rainfall with negative departure less than 40%. There are 343 Rain gauge stations in the state. The annual rainfall data (June to May) of five years 2015-16 to 2019-20 have been analyzed to calculate average rainfall of each district in the respective years.

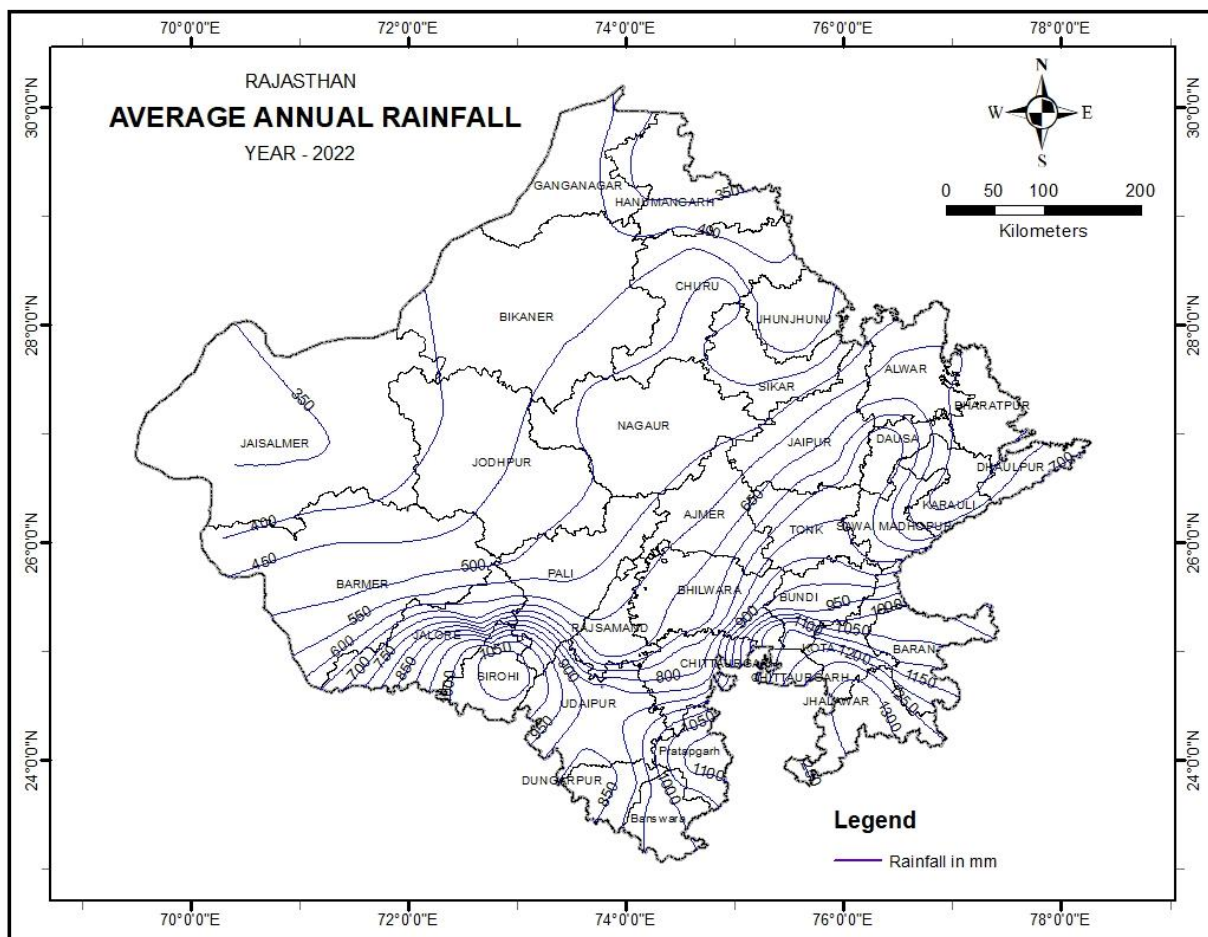


Plate-III: Average Annual Rainfall (mm) Map of Rajasthan for the year 2022

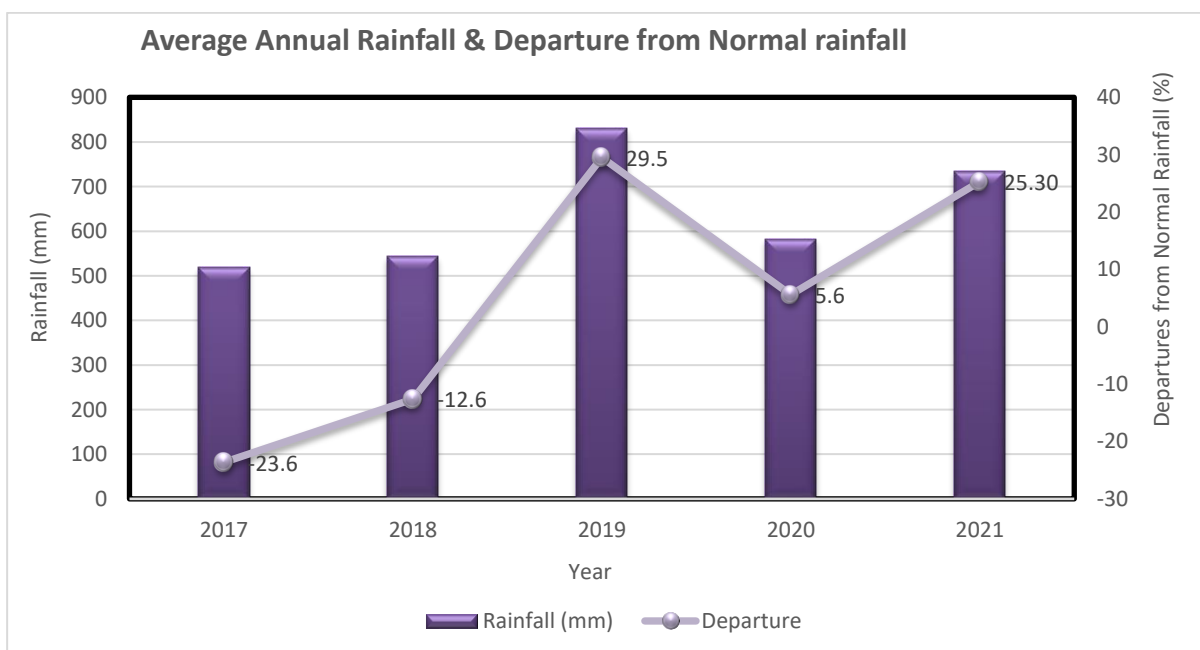


Plate IV: Average Annual Rainfall and Departure from Normal Annual Rainfall (%)

S. No.	District	Normal (1901-70)	Rainfall(mm)					Departures from Normal (%)				
			(2017-18)	(2018-19)	(2019-20)	(2020-21)	(2021-22)	(2017-18)	(2018-19)	(2019-20)	(2020-21)	(2021-22)
1	Ajmer	437	428	799	528	606	573.1	-2.09	45.31	17.17	27.92	23.75
2	Alwar	626	565	462	509	765	615.8	-10.82	-35.45	-22.87	18.18	-1.66
3	Banswara	870	813	1281	1055	878	998.3	-6.99	32.06	17.5	0.85	12.85
4	Baran	895.3	1004	1320	652	1363	1049.2	10.85	32.15	-37.24	34.31	14.67
5	Barmer	260	130	390	345	274	476	-99.59	33.32	24.54	5.16	45.38
6	Bharatpur	675.1	802	593	539	779	572.7	15.78	-13.78	-25.15	13.38	-17.88
7	Bhilwara	603.3	578	967	581	705	675.2	-4.4	37.59	-3.86	14.37	10.65
8	Bikaner	249.8	254	307	298	320	437.4	1.65	18.57	16.14	21.96	42.89
9	Bundi	715.8	636	1199	511	1106	920.5	-12.64	40.28	-40.22	35.29	22.24
10	Chittorgarh	772.3	730	1243	711	1029	785.8	-5.76	37.88	-8.65	24.91	1.72
11	Churu	337.9	341	476	485	593	508.7	0.86	29.08	30.33	43	33.58
12	Dausa	625.7	595	740	545	750	784.2	-5.16	15.42	-14.73	16.6	20.21
13	Dhaulpur	717.5	757	812	496	810	696.3	5.18	11.66	-44.66	11.46	-3.04
14	Dungarpur	610.4	788	1144	892	710	829.5	22.49	46.66	31.6	14.08	26.41
15	Ganganagar	171.6	182	231	240	201	400.5	5.95	25.87	28.57	14.62	57.15
16	Hanumangarh	237.5	206	353	359	377	317.9	-15.29	32.69	33.9	36.92	25.29
17	Jaipur	526.8	537	744	623	715	652.8	1.83	29.21	15.39	26.3	19.30
18	Jaisalmer	158.6	121	252	351	302	346.7	-31.44	37.02	54.81	47.51	54.25
19	Jalore	400.6	148	544	597	391	626.4	-170.68	26.38	32.87	-2.54	36.05
20	Jhalawar	884.8	966	1783	789	1294	1317.1	8.41	50.38	-12.14	31.62	32.82
21	Jhunjhunu	459.5	471	684	410	613	406.5	2.34	32.81	-12.04	25.04	-13.04
22	Jodhpur	296.7	211	436	414	324	457.5	-40.62	31.9	28.41	8.4	35.15
23	Karauli	616.2	571	584	559	871	582	-7.89	-5.59	-10.21	29.22	-5.88
24	Kota	808.7	755	1282	577	1319	1150.8	-7.08	36.94	-40.06	38.7	29.73
25	Nagaur	363.1	351	652	504	616	510.8	-3.56	44.34	27.96	41.08	28.92
26	Pali	484.5	325	753	585	512	540.6	-49.3	35.64	17.14	5.33	10.38
27	Pratapgarh	806	1152	1978	1068	1346	1129.6	30.06	59.26	24.5	40.14	28.65
28	Rajsamand	556.1	544	918	693	679	617	-2.22	39.39	19.74	18.15	9.87
29	Sawai Madhopur	655.8	919	898	623	1014	749	28.61	26.93	-5.29	35.33	12.44
30	Sikar	459.8	581	712	524	680	490.4	20.83	35.41	12.31	32.42	6.24
31	Sirohi	606.3	359	903	922	692	1074.7	-69.01	32.87	34.21	12.38	43.58
32	Tonk	598.2	527	863	480	818	802.4	-13.62	30.68	-24.53	26.89	25.45
33	Udaipur	632.7	565	1069	778	788	889.5	-11.94	40.84	18.68	19.7	28.87
RAJASTHAN		549.1	519.3	542.7	829	583	735	-12.6	29.5	5.6	23.3	21.16

2.3.2 Temperature

The hot weather season commences in the month of March and continues through April to June. In the month of May the diurnal range of temperature increases more and the days become hotter. During June, the mean maximum temperature reaches as high as 48°C.

January is the coldest month. The normal minimum temperature for the month of January ranges from 2°C in the north to 7.8°C in the south west in the western Rajasthan. At Mount Abu (1195 m AMSL), temperature dips to freezing point during the month of December /January. In eastern Rajasthan the range of normal minimum temperature (January) in and around the Aravalli hill ranges is 7°C to 8°C which increases towards the east and attains a high of more than 10°C in the districts of Kota and Bundi.

2.4 Geology

Diverse rock types ranging from the oldest Archaean rocks to sub- Recent alluvium and wind-blown sand are exposed in Rajasthan. In a major portion of the State, particularly in western Rajasthan, the oldest rocks are concealed below a thick cover of alluvium and windblown sands. A generalized stratigraphic succession of various formations and rock types is given in **Table-2** and a broad geology map of Rajasthan state is given in **Plate-V**.

2.4.1 Archaeans

The Archaeans in Rajasthan are represented by Bhilwara Supergroup and comprise Banded Gneissic Complex representing the oldest meta-sedimentary sequence along-with Berach Granite.

2.4.2 Proterozoics

Aravallis: Aravalli Supergroup unconformably overlies the Archaeans and consists of phyllites, greywackes, quartzites and dolomites intruded by granites and mafic rocks.

Delhis: These are exposed over a large part of central and north eastern Rajasthan and consist dominantly of quartzites, biotite-schist, calc-schist and marble.

Vindhyaans: Vindhyaans unconformably overlie Delhis and have been deposited in two separate basins on either side of the Aravallis. In the eastern part these comprise unmetamorphosed, relatively undisturbed, sandstones, limestones and shales. Great Boundary Fault separates them from Aravallis and Archeans.

Intrusives and Extrusives: Nepheline syenites are exposed around Kishangarh and are post-Delhi in age. Erinpura Granite is the principal intrusive into the Delhis and is exposed around Ajmer and Mount Abu. Malani Suite of igneous rocks consisting of rhyolites and pyroclastic material are exposed around Jodhpur and are post-Delhi in age.

2.4.3. Palaeozoics

In the western part of the state, Marwar Super Group of Lower Palaeozoic age consists of three groups namely Jodhpur group (mainly sandstone & shale), Bilara Group (mainly limestone and dolomite) and Nagaur Group (sandstone, siltstone and gypsum). Overlying the Marwar Super Group is the Badhura Formation of Permo-Carboniferous age comprising sandstones and boulders.

Table 2: Geological Succession of Rajasthan

GEOLOGICAL TIME UNIT		LITHOSTRATIGRAPHIC TIME UNIT		LITHOLOGY	
ERA	PERIOD	SUPER GROUP / GROUP			
RECENT				Alluvium and blown sand	
CAINOZOIC (TERTIARY)	Eocene	Mandai/ Akli/ Kapurdih/ Jogira/ Banda/ Khuiala / Palana		Sandstone, bentonitic clay & fuller's earth	
DECCAN TRAPS				Basalt	
MESOZOIC	Cretaceous	Abur / Fatehgarh		Sandstone, limestone, clay and lignite	
	Jurassic	Parihar/ Bhadesar/ Baisakhi/ Jaisalmer/ Lathi		Limetstone, sandstone & shale	
PALAEOZOIC	Permo- Carboniferous	Badhura		Sandstone & boulders	
		Marwar	Nagaur/ Bilara/ Jodhpur	Sandstone, gypsum, siltstone, limestone, dolomite & shale	
UPPER PROTEROZOIC		Vindhyan	Bhander/ Rewa/ Kaimur/ Semri	Sandstone, shale, limestone, conglomerate & basic flows	
		Acid, Basic and Ultrabasic Intrusives and Extrusives Malani Volcanics / Plutonics Kishangarh Syenite			
LOWER PROTEROZOIC		Delhi	Ajabgarh/ Alwar/ Sirohi/ Punagarh/ Raialo	Quartzite, schist, gneiss, marble, shale, slate, phyllite& basic flows	
		Granite, Basic & Ultrabasic Intrusives			
		Aravalli	Jharol/ Bari/ Udaipur/ Debari	Quartzite, schist, phyllite, conglomerate, greywacke, metavolcanics& marble	
		Granite & Basic Intrusives			
ARCHAEAN		Bhilwara	Ranthambore/ Rajpura-Dariba /Hindoli	Phyllite, slates, schist, gneiss, granite gneiss &migmatites	

2.4.4 Mesozoics

Mesozoics are exposed mainly in Jaisalmer and Barmer districts. These comprise of sandstones and limestone.

2.4.5 Deccan Traps

Deccan Traps occupy a part of southeastern segment of the state covering parts of Banswara, Baran, Jhalawar and Chittorgarh districts. These overlie pre-Aravalli's, Aravallis and Vindhyan. These are basaltic to doleritic in composition and are uniform over a large area.

2.4.6 Tertiaries

Sandstones, bentonitic clay and Fuller's earth are the main litho-units and are exposed in Barmer, Bikaner and Jaisalmer districts.

2.4.7 Recent

This group of formations consists of alluvium, blown sands, kankar and evaporites, which are widely spread in the state.

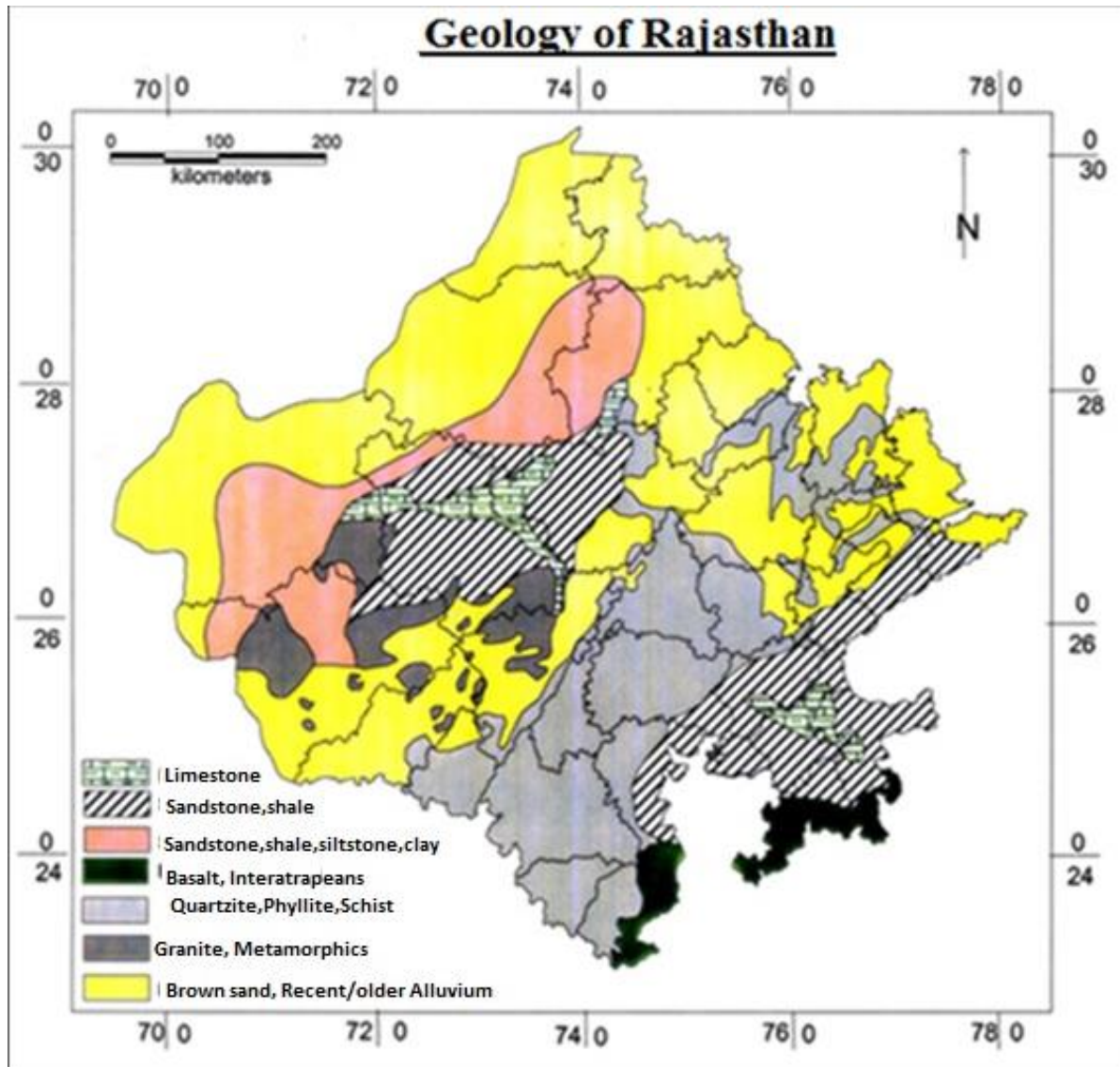


Plate-V: Geology Map of Rajasthan

2.5 Hydrogeology

The principal source of recharge to ground water in Rajasthan is rainfall. In canal irrigated areas, a part of canal water through seepage from conveyance system and part of water utilized for irrigation and returning to ground water contribute to storage. For broadly grouping geological formations from ground water occurrence & movement considerations, the various litho units have been classified into two groups on the basis of their degree of consolidation and related parameters. These are represented in Plate VI and described as below:

- I. Porous formations
 - (a) Unconsolidated formations
 - (b) Semi- consolidated formations
- II Fissured formations
 - (a) Consolidated sedimentary rocks
 - (b) Igneous and metamorphic rocks
 - (c) Volcanic rocks
 - (d) Carbonate rocks

2.5.1 Porous Formations

The Quaternary sediments comprising younger as well as older alluvium are the most important unconsolidated formations due to their wide-spread occurrence. The sediments are composed of clay, silt, sand, gravel and mixture of concretions etc. Sand, gravel and admixture of these form the potential aquifers in northern, eastern, north-eastern, western and south-western parts of the state. The maximum-drilled thickness of alluvium is 543.51 meter below ground level (m. bgl) at Anupgarh in Ganganagar district.

The semi-consolidated formations belonging to Palaeozoic, Mesozoic and Cainozoic Groups are composed of siltstone, claystone, sandstone, shale, conglomerate and limestone. Sandstones and lime stones form the main aquifers in Jaisalmer, Jodhpur, Barmer and Bikaner districts. Sandstones of Lathi formation are the most potential aquifers in the districts of Jaisalmer, Jodhpur and Barmer.

2.5.2 Fissured Formations

Fissured formations, as hydrogeological unit, occupy 32% area of the state and can be broadly classified into four units.

Consolidated sedimentary rocks, excluding carbonate rocks, include sandstones and shales. In eastern and south-eastern part of the state these belong to Vindhyan Supergroup whereas in western Rajasthan these belong to the Marwar Supergroup.

Igneous and metamorphic rocks of lower Proterozoic age comprise slate, quartzite, phyllite, schist, gneiss and various crystalline of Bhilwara Supergroup. These are mostly found in the districts of Banswara, Dungarpur, Udaipur, Chittorgarh, Bhilwara, Tonk, Jaipur, Alwar and Jhunjhunu in eastern

Rajasthan and Nagaur, Churu, Barmer, Jaisalmer, Pali, Jalore, Sirohi and Jodhpur districts in western Rajasthan.

Volcanic rocks include Deccan Trap Lava Flows and occur in parts of Barmer, Jhalawar, Chittorgarh and Banswara districts. These are basaltic to doleritic in composition. Occurrence and movement of ground water in these formations is controlled by the presence of vesicles, extent of weathering, jointing and fracture pattern.

Carbonate rocks include limestone, marble and dolomite of Proterozoic and Upper Palaeozoic to Mesozoic age and occupy parts of Kota, Bundi, Jaipur, Sawai Madhopur and Alwar districts on the eastern side of Aravallis and parts of Nagaur, Bikaner, Jaisalmer and Jodhpur districts in western Rajasthan.

2.5.3 Ground Water Level

The depth to water varies widely throughout the State; shallow water levels have been noticed in canal command area of Ganganagar, Banswara, Kota and Bundi districts whereas deeper water levels have been observed in the western districts, particularly Jaisalmer, Bikaner, Barmer and Jodhpur.

To the east of Aravalli's, the depth to water is comparatively shallower than that in the west. It generally varies between less than 10 meters and 40 meters in the eastern part, whereas in the western part, it ranges between 30 meters and 80 meters. The water table slopes towards east and south-east on the eastern side, whereas it slopes towards west and north-west in west of Aravalli's. However, local variations are common both in the direction and movement of ground water. Over-exploitation and excess use of ground water have led to substantial decline in water levels, which may ultimately result in drying up of aquifers in many areas of the State.

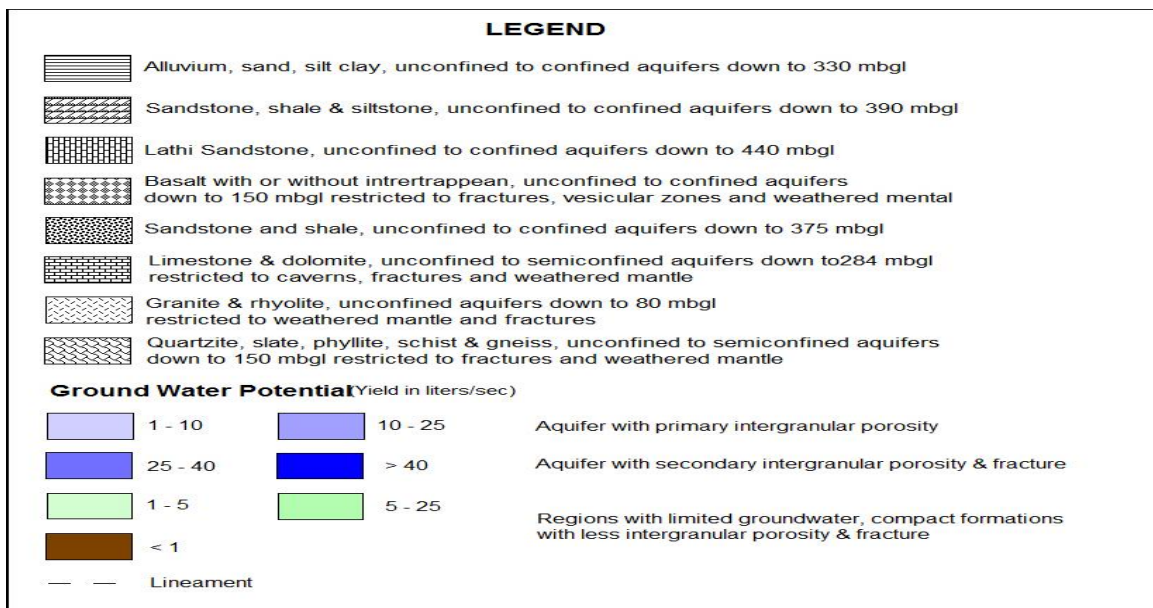
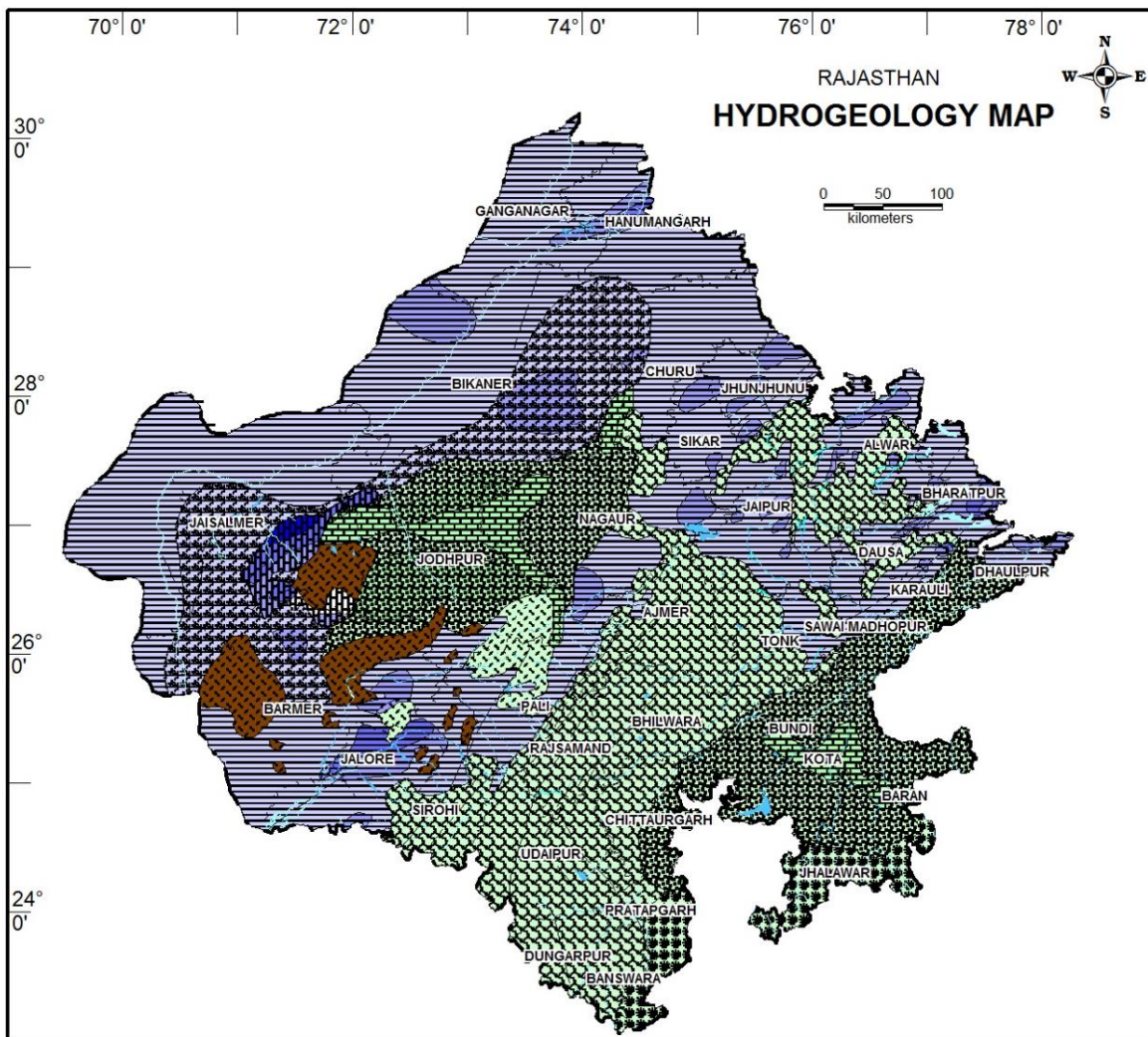


Plate-VI: Hydrogeological Map of Rajasthan

Pre-Monsoon Depth to Water level

Water level for the month of May 2022 in the state depicts that the most of the western part of the state have water levels more than 40 m, except small patches at Ganganagar and Hanumangarh due to Indira Gandhi canal and salinity issues there. Whereas east of the Aravalli's, Jaipur, Dausa, Alwar have water level in the range of 5 to 2 m. Some isolated patches in the eastern districts usually have water level in the range of 10- 40 m

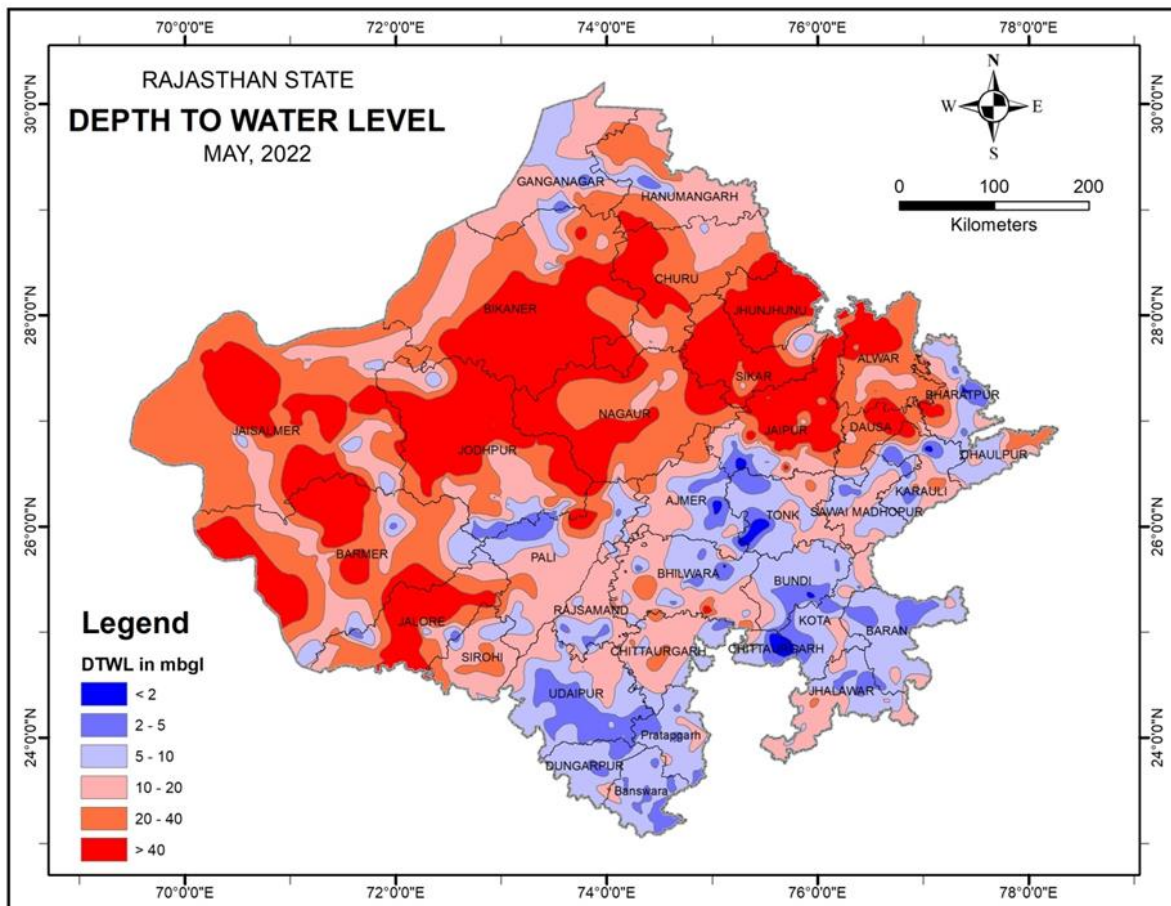


Plate-VII: Pre-monsoon Depth to Water Level (m bgl) Map of Rajasthan-2022

Post Monsoon Depth to Water level

Water level in the state for post monsoon season i.e. 2022 November depicts a slightly better condition in the eastern parts whereas the western part of the state still have water level in the tune of greater than 40 m depth in m of parts of the state, except Ganganagar, Hanumangarh and small patches in Pali (hard rock area)

The water level during post monsoon is shallower as compared to pre monsoon in most parts of the state due to recharge from rainfall.

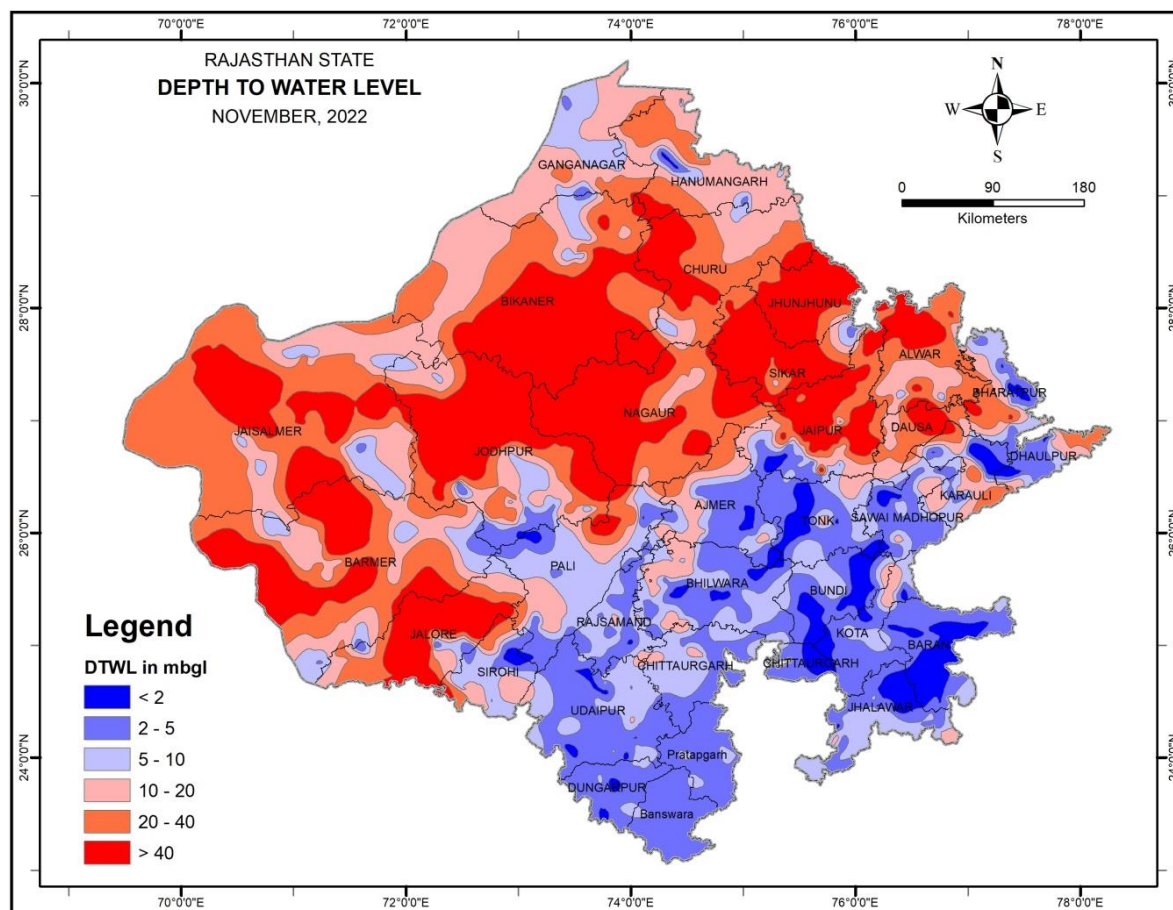


Plate-VIII: Post-monsoon Depth to Water Level (m bgl) Map of Rajasthan-2022

2.5.4 Ground Water Quality

In general, the chemical quality of ground water is fresh in the eastern part except in a few pockets of Bharatpur district particularly in Sesar, Nagar, Kumher and Deeg blocks where the ground water is brackish to saline. The chemical quality in major part of western Rajasthan is generally saline. However, potable ground water is found in the areas covered by sandstone and limestone of Marwar Super group, Lathi formations in Jaisalmer and Barmer districts, the Tertiaries in parts of Bikaner, Nagaur, Churu, Barmer and Jaisalmer districts and localized pockets in Quaternaries. High fluoride hazard is found in pockets in almost all the districts with varying intensity. Problems of high nitrate and other constituents beyond permissible limits of drinking and irrigation also exist in some arid districts. Increased use of fertilizers, poor sewerage system in urban agglomerates and industrial pollution has further caused deterioration in the quality of ground water.

3. Ground Water Resources Estimation Methodology

The previous ground water resources assessment of the State used to be done on the basis of recommendations of Ground Water Resource Estimation Methodology—1997 (GEC'97). The present methodology used for resources assessment is known as Ground Water Resource Estimation Methodology—2015 (GEC'2015). The basic concept of Assessment of Annually Replenishable or Dynamic Ground Water Resources is Inflow- Outflow = Change in Storage (of any Aquifer). Inflow refers to recharge from rainfall and other sources and subsurface inflow into the assessment unit. Outflow refers to ground water draft, ground water evapo-transpiration, base flow to streams and subsurface outflow from the unit. Since the data on subsurface inflow/ outflow are not readily available, it is advantageous to adopt the unit for ground water assessment as basin/ sub-basin/ watershed, as the inflow/ outflow across these boundaries may be taken as negligible.

Ground water resources assessment unit is in general watershed particularly in hard rock areas. In case of alluvial areas, administrative block can also be the assessment unit and for Rajasthan the administrative blocks are taken as assessment unit. In each assessment unit, hilly areas having slope more than 20% are deleted from the total area to get the area suitable for recharge. Further, areas where the quality of ground water is beyond the usable limits should be identified and handled separately. The remaining area, after deleting the hilly area and separating the area with poor ground water quality, is to be delineated into command and non-command areas. Ground water assessment in command and non-command areas is done separately in each hydro geological unit for monsoon and non-monsoon seasons.

3.1 Ground Water Recharge

Monsoon season

The resource during monsoon season is estimated as the sum total of the change in storage and gross draft. The change in storage is computed by multiplying water level fluctuation between pre and post monsoon periods with the area of assessment and specific yield. Monsoon recharge can be expressed as-

$$R = h \times S_y \times A + D_G$$

Where,

h = rise in water level in the monsoon season

A = area for computation of recharge

S_y = specific yield

D_G = gross ground water draft during monsoon

The monsoon ground water recharge has two components – rainfall recharge and recharge from other sources. Mathematically it can be represented as –

$$R \text{ (Normal)} = R_{rf}(\text{Normal}) + R_c + R_{SW} + R_t + R_{gw} + R_{wc}$$

Where,

R_{rf} is the normal monsoon rainfall recharge.

The other sources of ground water recharge during monsoon season include R_c , R_{sw} , R_t , R_{gw} , R_{wc} which are recharge from rainfall, seepage from canals, surface water irrigation, tanks and ponds, ground water irrigation, water conservation structures respectively.

The Rainfall recharge estimation based on water level fluctuation method reflects actual field conditions taken 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, using the relation:

$$R_{rf} = RIF * A * (R - a) / 1000$$

Where,

R_{rf} = Rainfall recharge in ham

A = Area in hectares

RIF = Rainfall Infiltration Factor

The rainfall recharge during monsoon season computed by Water Level Fluctuation (WLF) method is compared with recharge figures from Rainfall Infiltration Factor (RIF) method. In case the difference between the sets of data is more than 20%, then RIF figure is considered, otherwise monsoon recharge from WLF is adopted. While adopting the rainfall recharge figures, weightage is to be given to WLF method over ad-hoc norms method of RIF. Hence, wherever the difference between RIF & WLF is more than 20%, data have to be scrutinized and corrected accordingly.

Non-Monsoon Season

During non-monsoon season, rainfall recharge is computed by using Rainfall Infiltration Factor (RIF) method. Recharge from other sources is then added to get total non-monsoon recharge. In case of areas receiving less than 10% of the annual rainfall during non-monsoon season, the rainfall recharge is ignored.

Total Annual Ground Water Recharge

The total annual ground water recharge of the area is the sum total of monsoon and non-monsoon recharge. An allowance is kept for natural discharge in the non-monsoon season by deducting 5% of total annual ground water recharge, if WLF method is employed to compute rainfall recharge

during monsoon season and **10%** of total annual ground water recharge if RIF method is employed. The balance ground water available accounts for existing ground water withdrawal for various uses and potential for future development. This quantity is termed as Annual Extractable Ground Water Resources (EGR).

$$\begin{aligned} \text{Annual Extractable Ground Water Resources (EGR)} \\ &= \text{Total annual ground water recharge} \\ &- \text{Natural Discharge during nonmonsoon season} \end{aligned}$$

3.2. Ground Water Draft

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

$$[GE]_{ALL} = [GE]_{IRR} + [GE]_{DOM} + [GE]_{IND}$$

Where,

GE_{ALL} = Ground water extraction for all uses

GE_{IRR} = Ground water extraction for irrigation use

GE_{DOM} = Ground water extraction for domestic uses

GE_{IND} = Ground water extraction for industrial uses

The Ground water extraction for irrigation use would include the ground water extraction from all existing ground water structures during monsoon as well as during non-monsoon period. While the number of ground water structures should preferably be based on latest well census, the average unit draft from different types of structures should be based on specific studies or adhoc norms recommended by GEC 2015. The Ground water extraction for irrigation use is also calculated by other method called crop water requirement in which for each crop, the season –wise net irrigation water requirement is determined. The domestic and industrial ground water extractions are calculated separately in highly industrialised area elsewhere industrial extraction were included in domestic one.

3.3 Stage of Ground Water Extraction & Categorization of Units

The Stage of Ground Water extraction is defined by:

$$\begin{aligned} \text{Stage of Ground Water Extraction (\%)} \\ &= \frac{(\text{Existing Gross Ground Water Extraction for all uses})}{(\text{Annual Extractable Ground Water Resources})} \times 100 \end{aligned}$$

Validation of Stage of Ground Water Extraction

Long term water level trends are to be prepared for minimum period of 10 years for both pre-monsoon and post monsoon period. The water level trend would be average water level trend as obtained from the different observation wells in the area.

If the ground water resources and the trend of long-term water level contradict each other, this anomalous situation required a review of the ground water resources 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

In case, the category does not match with the water level trends given above, a reassessment should be attempted.

Categorization of Assessment Unit Based on Quantity:

The Categorization of Assessment Unit Based on Quantity is defined by Stage of Ground Water Extractions given below (**Table-III**):

Table-III: The Criteria for Categorization of Assessment Units

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

3.4 Allocation of Ground Water Resource for Utilization

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. The estimate of allocation for domestic water requirement may vary for one sub unit to the other in different states. In situations where adequate data is not available to make this estimate, the following empirical relation is recommended.

$$Alloc. = 22 \times N \times L_{(gmm/year)}$$

Where,

Alloc. =Allocation for domestic water requirement N = population density in the unit in thousands per sq. km. Lg= fractional load on ground water for domestic water supply (≤ 1.0). In deriving above equation, 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.

3.4.1 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.

3.5. Poor Quality Ground Water

Computation of ground water recharge in poor quality ground water is to be done on the same lines as described above. However, in saline areas, there may be practical difficulty due to non-availability of data, as there will usually be no observation wells in such areas. Recharge assessment in such cases may be done based on rainfall infiltration factor method. This report however comprises data of the fresh ground water resources.

3.6. Additional Potential recharge

In shallow water table areas, particularly in discharge areas, rejected recharge would be considerable and water level fluctuations are subdued resulting in underestimation of recharge. In areas where ground water level is less than 5m below ground level or in waterlogged areas, ground water resources have to be estimated up to 5m bgl only based on the following equation—

$$\text{PotentialGroundWaterRecharge} = (5 - D) \times A \times \text{Sp.Yield}$$

Where,

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

A = Area of shallow water table zone.

4. Computation of Ground Water Resources

4.1. Norms Adopted

i) Specific yield

Specific yield values for alluvial formation in the range of 0.06 - 0.15 have been considered depending on degree of compaction. Specific yield for semi-consolidated sedimentary formations, i.e.,

Lathi sandstone and Tertiary sandstone have been taken in the range of 0.06-0.07 and 0.04-0.06 respectively. Specific yield values for various consolidated and other formations considered for computations are given in **Table- IV**.

ii) Rainfall Infiltration Factor (RIF)

RIF for alluvial areas has been taken from 0.06 to 0.18 depending on rainfall distribution. Such values for Semi-consolidated Lathi basin area have been considered ranging from 0.03 to 0.07 % while for Tertiary formation, values ranging from it is 0.03 to 0.05% have been adopted.

iii) Seepage from Tanks and ponds

Seepage factor of **2% to 9%** of live storage in Hard rock areas and **15%** of live storage in alluvial formation areas have been taken for estimations. Alternatively, value of **1.4 mm/day** of water spread has been taken.

iv) Seepage from canal

Seepage factor of **1.5 to 15 and 3 to 15** ham/day of wetted area have been considered for lined and un-lined canals respectively.

v) Return Flow from Surface Water Irrigation

Seepage factor of **10% to 30%** of water applied have been taken depending on type of crops and depth to water table (**Table-V**).

vi) Return Flow from Ground Water Irrigation

Seepage factor of **5% to 25%** of water applied have been taken depending on type of crops and depth to water table (**Table-V**).

vii) Natural discharge

Natural discharge of the magnitude of **5% and 10%** of gross recharge were taken for Water Level Fluctuation and Rainfall Infiltration Factor Method respectively,

viii) Ground Water Draft

Groundwater draft has been estimated differently for groundwater abstraction structures mainly dug well, dug well with pump, dug cum bore well and tube well considering unit draft and average period of operation. Details of norms adopted for draft calculation in various formations have been furnished in table of Norms Adopted.

Table- IV: Norms Adopted for Yield and Rainfall Infiltration factor

Formation	Symbol	Sp. Yield	R.I.F.	Yield (lpd)			
				DW	DW with pump	DCB/Cavity well	TW
Alluvium	A	0.06 -- 0.15	0.06 --0.18	20000 - 70000	50000 -2,50000	1,00000 - 1,50000	60000 - 3,00000
Older Alluvium	Ao	0.05-- 0.12	0.06 --0.18	25000 - 45000	50000 - 1,20000	50000 - 1,50000	60000 - 1,60000
Baisakhi Shale	BSKH	0.04	0.05	-	-	-	-
Basalt	B	0.01 -- 0.0175	0.02 --0.08	30000 - 60000	40000 - 80000	-	45000 - 1,00000
Bhadesar Series	Bd	0.04		-	-	-	20000 - 30000
Granite	G/Gr	0.01 -- 0.02	0.03 --0.08	20000 - 45000	30000 - 90000	25000	40000 - 1,50000
Gneisses	Gn	0.01 --0.025	0.02 --0.07	20000 - 50000	25000 - 65000	-	50000 - 80000
Lathi	L	0.06 --0.07	0.03 --0.07	-	25000	260,000	1,00000 - 2,70000
Lime Stone	Lst	0.015 --0.07	0.03 --0.10	30000 - 70000	40000- 2,50000	70000 - 1,50000	70000 - 3,00000
Parewar Form.	P	0.04	0.05	-	-	-	1,73000 - 4,76000
Phyllite/ Schist	Ph/Sc	0.0115 --0.0225	0.02 --0.08	20000 - 60000	30000 - 1,20000	-	35000 - 1,25000
Quartzite	Q	0.01 --0.02	0.06 --0.08	25000 - 50000	45000 - 75000	-	1,00000 - 1,50000
Rhyolite	R	0.015 --0.02	0.05 --0.07	25000	50000	40000 - 65000	50000 - 65000
Schist	Sc	0.015 --0.02	0.03 --0.08	25000 - 50000	35000 - 70000	-	50000 - 70000
Quartzite/Slate	Q/SI	0.02	0.07	25000	75000	-	90000
Shale	Sh	0.01 --0.015	0.03 --0.07	25000 - 30000	35000 - 50000	-	45000 - 90000
Sand Stone	Ss	0.01 --0.04	0.06 --0.15	20000 - 40000	50000 - 1,25000	55000 - 1,00000	60000 - 2,16000
Tertiary Sand Stone	T	0.04 --0.06	0.03 --0.05	-	-	-	1,20000 - 2,70000
Ultra basics	Ub	0.0125	0.03	35000	45000	-	50000

Table- V: Norms for Surface Water and Ground Water Irrigation Return Flow Factor

DTWL m bgl	Ground Water		Surface Water	
	Paddy	Non-Paddy	Paddy	Non-Paddy
<=10	45	25	50	30
11	43.3	23.7	48.3	28.7
12	41.7	22.3	46.7	27.3
13	40	21	45	26
14	38.3	19.7	43.3	24.7
15	36.7	18.3	41.7	23.3
16	35	17	40	22
17	33.3	15.7	38.3	20.7
18	31.7	14.3	36.7	19.3
19	30	13	35	18
20	28.3	11.7	33.3	16.7
21	26.7	10.3	31.7	15.3
22	25	9	30	14
23	23.3	7.7	28.3	12.7
24	21.7	6.3	26.7	11.3
>=25	20	5	25	10

4.2 Ground Water Resources Assessment: Introduction of India Ground Water Resource Estimation System

Ground Water Assessment in the State of Rajasthan has been carried out in association with Ground Water Department, Rajasthan as on 31st March 2023 based on guidelines of Ground Water Estimation Committee (GEC), 2015. Block (Panchayat Samiti) has been considered as assessment unit. The blocks have been further divided into formation potential zones. There are a total of **295** blocks and **877** formation potential zones in **33** districts of the State. This year attempt has also been made to do the additional assessment of dynamic ground water resources for the seven cities in the state. The district wise summary is given in Annexure-I and the Block wise/Assessment unit wise annual extractable ground water resources, Existing gross ground water extraction for all uses, Stage of ground water extraction and categorization of 302 assessment units is given in Annexure IV

Water level fluctuations for the last 5 years (2016-2022) were considered for groundwater recharge estimation while groundwater draft was assessed as on **March 2023**. Groundwater requirement for domestic & industrial purposes were projected for the year **2025 AD**.

Earlier up to year 2017, Dynamic Ground Water Resources Assessment was done manually through computer using GEC, 2015 Methodology. But for the first time in year 2020, INDIA GEC Software has been introduced with the aim “Automation of Estimation of Dynamic Ground Water Resources using GEC-2015 methodology and Related Research work to improve GEC Assessment” and dynamic Ground water resources have been assessed through this software. In order to compute data for GEC, 11 excel templates are provided for the user to fill and submit the data in the system for an Assessment Unit. User can also submit the data using form inputs for a particular Assessment unit.

User needs to upload a state shape file with Assessment unit, hierarchy and geometry. This information needs to be embedded into the shape file's attribute table. The GIS view of India GEC let the user visualize the Assessment Unit categorization geographically on top of other map layers. Each assessment unit is color coded based on the categorization (SAFE, SEMI-CRITICAL, CRITICAL and OVER-EXPLOITED). This view also shows data for each of the GEC component in the information panel at the right side. By default, the view starts at India level map with all the states showing the latest categorization of the assessment units. This year the resources have been calculated through *INGRES software*.

As per the estimates, Rajasthan has Annual Extractable Ground Water Resource of the tune of **11251.35 MCM**. Block wise range of Annual Extractable Ground Water Resource is depicted in **Plate-IX** The existing gross ground water extraction for all uses is of the magnitude of **16739.06MCM**. Block wise range of existing gross ground water extraction for all uses is depicted in **Plate-X**. The overall stage of groundwater extraction in the State is **148.77%**.

Allocation of Annual ground water for domestic water supply as on 2025 is **2253.94MCM** & Net ground water availability for Future use is **899.36 MCM**.

The assessment units (Blocks) have been categorized based on stage of ground water extraction. At block level majority of the blocks fall in Over Exploited category. Out of **302** assessment units for which computations have been done, **216** fall in Over Exploited Category, **23** in Critical, **22** in Semi Critical and **38** in Safe Category. Three block viz Taranagar of Churu, Khajuwala of Bikaner and Rawatsar of Hanumangarh districts have been assessed as saline. Number of assessment units in Rajasthan falling under different categories as on 31.03.2023 is given below in **table VI**.

District wise distribution of assessment units in different categories as on 31.03.2023 is given in **Table VII**

District wise name of assessment units falling in different category is given in **Table VIII**

Block wise Stage of Ground Water Development of Rajasthan as on 30.03.2023 and Blocks falling in different category Map for Rajasthan as on 30.03.23 are depicted in **plates XI and XII respectively**

Table VI: Number of assessment units in Rajasthan falling as under different categories as on 31.03.2023

S. No.	Category	No. of Blocks	S. No.	Category	No. of Blocks
1	Safe	38	3	Critical	23
2	Semi-critical	22	4	Over Exploited	216
5	Saline	3		Total	302

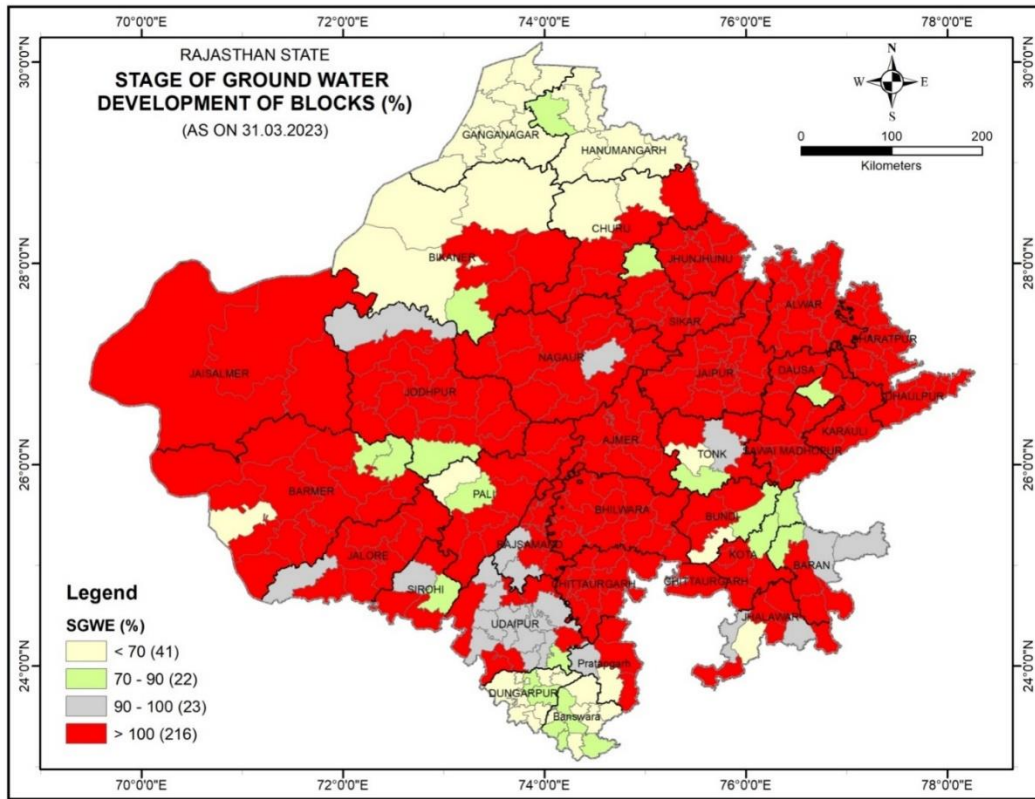


Plate-XI: Assessment Unit wise Stage of Ground Water Development of Rajasthan as on 30.03.2023

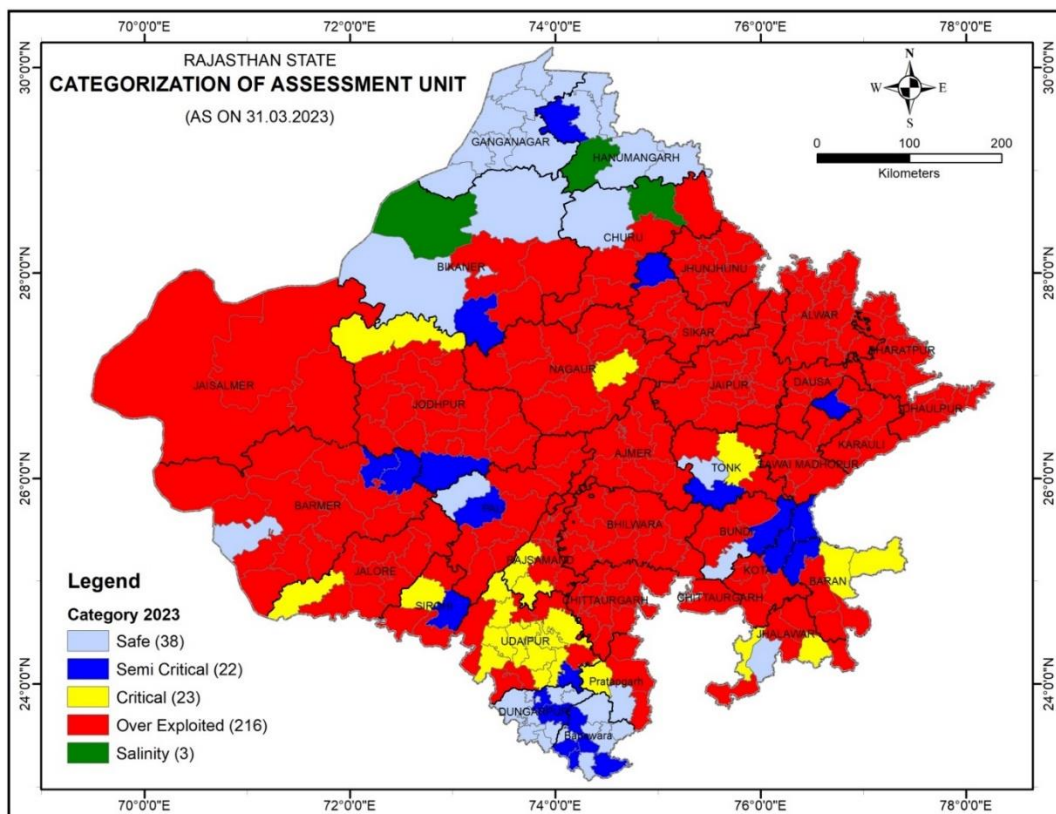


Plate XII: Assessment Units falling in different category Map for Rajasthan as on 30.03.23

4.3 Areas having Ground Water Development Prospects

Estimates reveal the fact that scope for future groundwater resource development in the state of Rajasthan is very less. As per present groundwater resource estimates out of a total **302** assessment units in the state **216** units are categorized as **Over-exploited**, **23** units as **Critical**, **22** units as **Semi Critical**. Remaining **38** units, which have been, categorized as **Safe**, do have constraints for groundwater development due to deep water levels, its poor quality or falling in canal command. Taranagar block of Churu, Rawatsar block of Hanumangarh and Khajuwala of Bikaner districts have been assessed as saline due to poor quality in the entire blocks. Block wise category map is shown in fig. IX.

However, in canal command areas, conjunctive use of groundwater & canal water is the need of the hour so as to avoid land degradation by water logging hazards and soil salinity/alkalinity.

Scope for development of saline/high fluoride ground water especially in the western Thar Desert exists with due care for desalination/ de-fluoridation technology however, such areas need to be further explored and investigated prior to formulation of any project in this regard.

Since a large number of assessment units have come under the over exploited category, there is an urgent need for enforcement of groundwater regulation, control and management strategies in Over-exploited areas. Action to impose and implement restrictions on installation of new wells in Notified areas need be initiated. Implementation of feasible schemes on rainwater harvesting and artificial recharge structures in Over-exploited areas need to be taken up at war footing.

4.4 Spatial Variation of Groundwater Resources

Rajasthan State witness's wide spectrum of hydrogeological conditions and availability of groundwater resources as well. Groundwater recharge in Thar Desert area of Western Rajasthan is mostly less owing to arid climatic conditions (low rains & high evaporation) and ground water development is also relatively less due to constraints of deep groundwater levels & inferior quality of water as well as availability of canal water in parts. Due to availability of canal water & high rains in Banswara and Dungarpur, they fall under Safe category. Further, due to poor quality of groundwater and availability of canal water in Ganganagar and Hanumangarh districts, these have been categorized them under Safe category, Churu district, Bikaner & Jaisalmer districts are under Over-exploited category. Hard rock areas of Aravalli hills are vulnerable to water crisis during spell of drought due to their limited scope for dynamic recharge to groundwater. Groundwater development in alluvial plain areas especially on either side of Aravalli Hill Ranges is on higher side and most of the blocks fall under Over Exploited category.

4.5 Comparison with the earlier Groundwater Resource Estimates

Efforts have been made to compare groundwater estimates as on **31.03.2022** and as on **31.03.2023** (estimated as per GEC 2015 methodology) for knowing changes in groundwater resources and are given below in table IX

Table IX: Comparison of Ground water Resources 2023 and 2022

Particulars	2023	2022
Annual Extractable Ground Water Resources	1107363.46 ham	1095955.78ham
Total Annual Ground Water Extraction	1673907.14 ham	1655618.03 ham
Stage of Ground Water Extraction (%)	148.77	151.06%
Category of assessment units		
Safe assessment units	38	38
Semi-Critical assessment units	22	20
Critical assessment units	23	22
Over-Exploited assessment units	216	219
Saline assessment units	03	03
Total of assessment units	302	302

The estimates reveal there was significant increase in Annual Extractable Groundwater resource of the magnitude of 1125135 hams in 2023 and 1095955.78 hams in 2022 and respectively. Current annual Gross Groundwater extraction for all uses during these four years from **1655618.03ham** in **2022** to **1673907.14 ham** in 2023 with overall result in the decrease of the stage of groundwater extraction from **151.07%. To 148.77%**

A detailed comparison of categories of assessment units on 31.03.2022 and 31.03.2023 is given in **table X**

5. Dynamic Ground Water Resources of Urban Cities in Rajasthan

In NITI Aayog report entitled “Composite Water management Index –A Tool for water management” it has been mentioned that 21 cities across India are expected to run out of water by 2020. In this Connection, CGWB was entrusted to study the groundwater situation in 24 cities (Annexure-1) and a Committee was constituted vide **L.No.95/TC/Chmn/CGWB/2016-17-4533 dated 27.07.2018** to Study the groundwater situation and submit a report. A book entitled “**Groundwater Resources Vs Domestic Water Demand and Supply for select cities in India**”. In continuation to that study, first time during year 2022, Dynamic ground water resources for 7 cities in Rajasthan have been computed. This year also the Dynamic Ground Water resources separately for these 7 cities viz Ajmer, Bikaner, Jaipur, Jaisalmer, Kota, Udaipur and Jodhpur has been calculated. The location along with category of these even cities is given in **Plate -XIII** and details of the resources in **Annexure-II**.

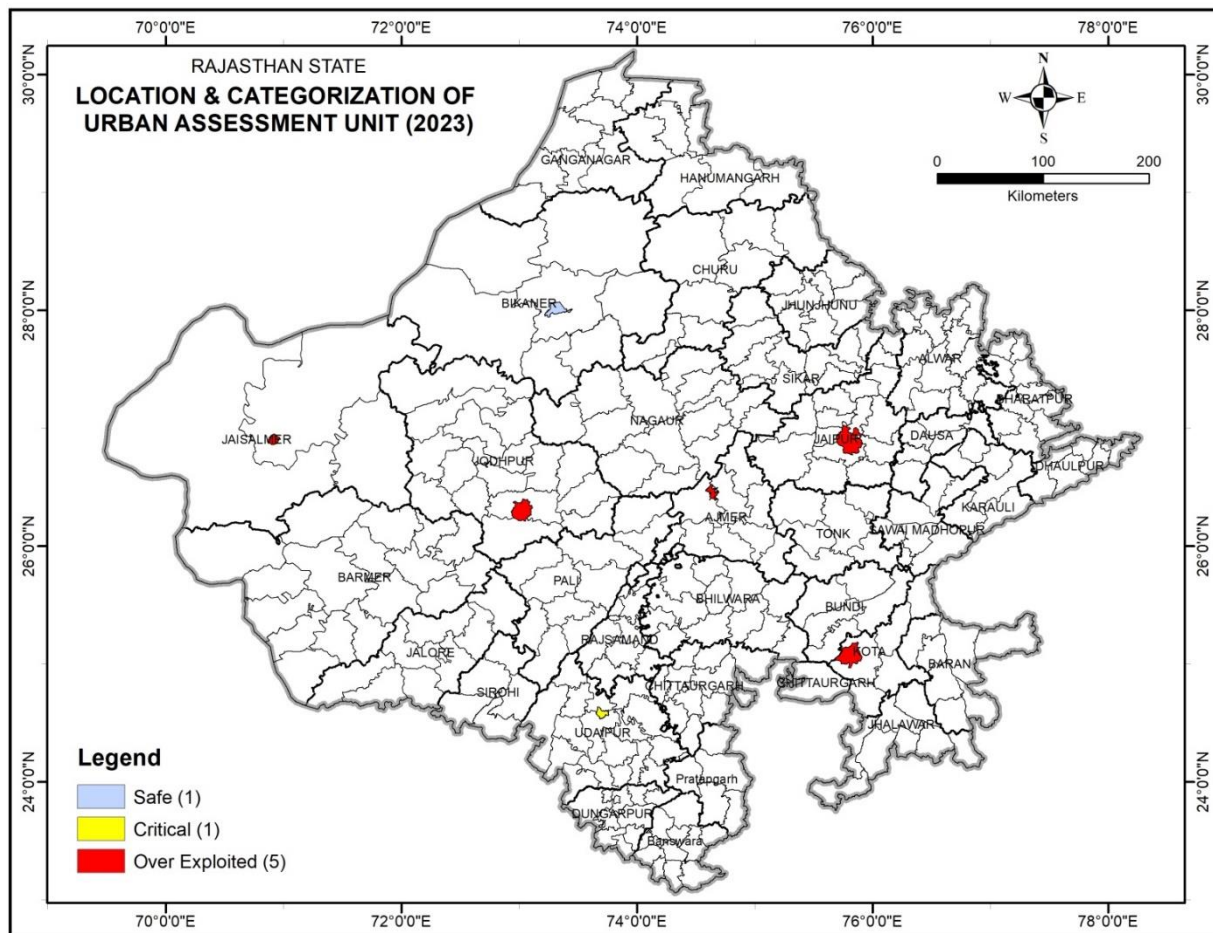


Plate-XIII: Location and Categorization of Urban Assessment Units-Rajasthan-202

Annexure- I: District wise Resources of Rajasthan (ham) as on 31.03.2023

S. No.	Name of District	Ground Water Recharge (ham)							Current Annual Ground Water Extraction (Ham)						Stage of Ground Water Extraction (%)
		Monsoon Season	Non-monsoon Season		Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Irrigation	Industrial	Domestic	Total	Annual GW Allocation for Domestic Use on 2025	Net Ground Water Availability for future use		
		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	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	5856.48	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	5026.4	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	4.45	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	661.15	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	3137.34	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	4296.72	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	JHUNJHUNUN	21046.63	294.98	1734.62	1474.86	24551.09	2455.11	22095.98	35396.64	564.16	11912.02	47872.82	11849.18	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	14936.04	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	NAGPUR	56744.71	1077.11	1523.73	3330.84	62676.39	6032.61	56643.77	88158.52	1147.65	13604.42	102910.61	12938.82	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	4121.65	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	AWAI 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	901432.13	64317.62	19425.37	260023.84	1245198.96	120063.46	1125135.44	1430424.28	12777.86	230704.79	1673907.14	225394.7	89936.8	148.77

Dynamic Ground Water Resources of Rajasthan 2023

Annexure-II Ground Water Resources of Urban Cities, Rajasthan-2023

District	Assessment Unit Name	Recharge Worthy Area (ha)	Recharge from Rainfall -Mon	Recharge from Other Sources -MON	Recharge from Rainfall -NM	Recharge from Other Sources -NM	Total Annual Ground Water Recharge	Total Natural Discharges (Ham)	Annual Extractable Ground Water Resource	Irrigation Use	Industrial Use	Domestic Use	Total Extraction	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)	Categorization (OE/Critical/Semi critical/Safe)
									Ham								
AJMER	AJMER_URBAN	6607	202.9	0.8	2.5	29.4	235.6	23.6	212.1	271.8	0.0	89.7	361.5	89.7	0.0	170.5	overexploited
BIKANER	BIKANER_URBAN	14113	165.4	22.4	24.2	64.9	276.9	27.7	249.2	70.2	2.0	57.6	129.8	57.6	119.4	52.1	safe
JAIPUR	JAIPUR_URBAN	35522	1243.0	0.0	28.1	0.0	1271.1	127.1	1144.0	0.0	244.8	3662.1	3906.9	3662.1	0.0	341.5	overexploited
JAISALMER	JAISALMER_URBAN	6467	53.4	1.1	3.1	3.2	60.8	6.1	54.7	84.0	2.3	64.8	151.1	64.8	0.0	276.4	overexploited
JODHPUR	JODHPUR_URBAN	23523.77	425.3	22.3	0.0	49.4	497.0	49.7	447.3	134.2	16.7	323.9	474.7	323.9	0.0	106.1	overexploited
KOTA	KOTA_URBAN	62628	1922.9	90.9	0.0	348.1	2361.8	236.2	2125.6	1401.7	34.0	1098.0	2533.7	1098.0	216.7	119.2	overexploited
UDAIPUR	UDAIPUR_URBAN	6400	161.2	161.1	0.0	364.6	686.9	68.7	618.2	0.0	95.3	522.0	617.4	522.0	0.9	99.9	critical

Table - VII: District wise distribution of assessment units in different categories as on 31.03.2023

S.No.	Name of District	Number of assessment units	Category of assessment units				
			Safe	Semi-Critical	Critical	Over-Exploited	Saline
1	Ajmer	10	-	-	-	10	-
2	Alwar	14	-	-	-	14	-
3	Banswara	11	6	5	-	-	-
4	Baran	7	-	1	2	4	-
5	Barmer	17	1	2	-	14	-
6	Bharatpur	10	-	-	-	10	-
7	Bhilwara	12	-	-	-	12	-
8	Bikaner	8	3	1	-	3	1
9	Bundi	5	1	1	-	3	-
10	Chittaurgarh	11	-	-	-	11	-
11	Churu	7	1	-	-	5	1
12	Dausa	6	-	-	-	6	-
13	Dhaulpur	5	-	-	-	5	-
14	Dungarpur	10	8	2	-	-	-
15	Ganganagar	9	9	-	-	-	-
16	Hanumangarh	7	5	1	-	-	1
17	Jaipur	16	-	-	-	16	-
18	Jaisalmer	4	-	-	-	4	-
19	Jalor	8	-	-	1	7	-
20	Jhalawar	8	1	-	2	5	-
21	Jhunjhunun	8	-	-	-	8	-
22	Jodhpur	17	-	1	1	15	-
23	Karauli	6	-	1	-	5	-
24	Kota	6	-	2	-	4	-
25	Nagaur	14	-	-	1	13	-
26	Pali	10	1	-	1	8	-
27	Pratapgarh	5	1	-	1	3	-
28	Rajsamand	7	-	-	2	5	-
29	Sawai Madhopur	6	-	-	-	6	-
30	Sikar	9	1	-	-	8	-
31	Sirohi	5	-	1	1	3	-
32	Tonk	6	1	1	1	3	-
33	Udaipur	18	-	1	11	6	-
	Total	302	38	22	23	216	3

Table - VIII: District wise Name of Blocks Falling in Different Categories as on 31.03.2023

S. No	Name of District	Total Number of blocks	Name of Safe blocks	Name of Semi-Critical blocks	Name of Critical blocks	Name of Over-Exploited blocks	Name of Saline blocks
1	AJMER	10				ARAIN	
						BHINAY	
						JAWAJA	
						KEKRI	
						KISHANGARH	
						MASOODA	
						PEESANGAN	
						SARWAR	
						SHRINAGAR	
						AJMER_URBAN	
2	ALWAR	14				BANSUR	
						BEHROR	
						KATHUMAR	
						KISHANGARH BAS	
						KOTKASIM	
						LAXMANGARH	
						MANDAWAR	
						NEEMRANA	
						RAJGARH	
						RAMGARH	
						RENI	
						THANAGAZI	
						TIJARA	
						UMREN	
3	BANSWARA	11	ARTHOONA	ANANDPURI			
			BANSWARA	BAGIDORA			
			CHHOTISARVAN	GANGAR TALAI			
			GHATOL	GARHI			
			SAJJANGARH	KUSHALGARH			
			TALWARA				
4	BARAN	7		ANTAH	KISHANGANJ	ATRU	
					SHAHBAD	BARAN	

S. No	Name of District	Total Number of blocks	Name of Safe blocks	Name of Semi-Critical blocks	Name of Critical blocks	Name of Over-Exploited blocks	Name of Saline blocks
						CHHABRA	
						CHHIPABAROD	
5	BARMER	17	CHOHTAN	PATODI		BALOTRA	
				KALYANPUR		BARMER	
						BAYTOO	
						DHANAPOO	
						DHORIMANNA	
						GADRAROAD	
						GIRA	
						RAMSAR	
						SAMDARI	
						SERWA	
						SHEO	
						SINDHARI	
						GUDHAMALANI	
						SIWANA	
6	BHARATPUR	10				BAYANA	
						KAMAN	
						KUMHER	
						NADBAI	
						NAGAR	
						PAHARI	
						RUPBAS	
						SEWAR	
						WEIR	
						DEEG	
7	BHILWARA	12				ASIND	
						BANERA	
						BIJOLIYAN	
						HURDA	
						JHAZPUR	
						KOTRI	
						MANDAL	

S. No	Name of District	Total Number of blocks	Name of Safe blocks	Name of Semi-Critical blocks	Name of Critical blocks	Name of Over-Exploited blocks	Name of Saline blocks
						MANDALGARH	
						RAIPUR	
						SAHARA	
						SHAH PURA	
						SUWANA	
8	BIKANER	8	KOLAYAT	PANCHOO		BIKANER_RURAL	KHAJUWALA
			LUNKARANSAR			DUNGARGARH	
			BIKANER_URBAN			NOKHA	
9	BUNDI	5	TALERA	KESHORAI PATAN		HINDOLI	
						NAINWA	
						BUNDI	
10	CHITTAURGARH	11				BARI SADRI	
						BEGUN	
						BHADESAR	
						BHAINSRORGARH	
						BHOPALSAGAR	
						CHITTAURGARH	
						DUNGLA	
						GANGRAR	
						KAPASAN	
						NIMBAHERA	
						RASHMI	
11	CHURU	7	SARDARSHAHAR			RAJGARH	TARANAGAR
						RATANGARH	
						SUJANGARH	
						BIDASAR	
						CHURU	
12	DAUSA	6				BANDIKUI	
						DAUSA	
						LALSOT	
						LAWAN	
13.	DHOLPUR					MAHWA	
						RAJAKHERA	

S. No	Name of District	Total Number of blocks	Name of Safe blocks	Name of Semi-Critical blocks	Name of Critical blocks	Name of Over-Exploited blocks	Name of Saline blocks
						SAIPAU	
						BARI	
14	DUNGARPUR	10	ASPUR	DOVRA			
			BICHHIWARA	SAGWARA			
			CHEEKHLI				
			DUNGARPUR				
			GALIAKOT				
			JHONTHRI				
			SABLA				
			SIMALWARA				
15	GANGANAGAR	9	ANUPGARH				
			GANGANAGAR				
			GHADSANA				
			KARANPUR				
			PADAMPUR				
			RAISINGHNAGAR				
			SADULSHAHAR				
			SURATGARH				
			SRI VIJAYNAGAR				
16	HANUMANGARH	7	BHADRA				RAWATSAR
			HANUMANGARH				
			NOHAR				
			RAWATSAR	PILIBANGA			
			SANGARIYA				
			TIBI				
17	JAIPUR	16				AMBER	
						BASSI	
						CHAKSU	
						DUDU	
						GOVINDGARH	
						JALSOO	
						JAMWA RAMGARH	
						JHOTWARA	

S. No	Name of District	Total Number of blocks	Name of Safe blocks	Name of Semi-Critical blocks	Name of Critical blocks	Name of Over-Exploited blocks	Name of Saline blocks
						KOTPUTLI	
						PAOTA	
						PHAGI	
						SAMBHAR	
						SANGANER	
						SHAH PURA	
						VIRATNAGAR	
						JAIPUR_URBAN	
18	JAISALMER	4				JAISALMER	
						SAM	
						SANKRA	
						JAISALMER_URBAN	
19	JALOR	8			CHITALWANA	AHORE	
						BHINMAL	
						JALORE	
						JASWANTPURA	
						RANIWARA	
						SANCHORE	
						SAYLA	
20	JHALAWAR	8	PIRAWA		AKLERA	BAKANI	
					BHAWANI MANDI	DAG	
						JHALRAPATAN	
						KHANPUR	
						MANOHAR THANA	
21	JHUNJHUNUN	8				ALSISAR	
						BUHANA	
						CHIRAWA	
						JHUNJHUNU	
						KHETRI	
						NAWALGARH	
						SURAJGARH	
						UDAIPURWATI	
22	JODHPUR	17		BAP	LUNI	BALESAR	

S. No	Name of District	Total Number of blocks	Name of Safe blocks	Name of Semi-Critical blocks	Name of Critical blocks	Name of Over-Exploited blocks	Name of Saline blocks
						BAORI	
						BAPINI	
						BHOPALGARH	
						BILARA	
						DECHOO	
						LOHAWAT	
						MANDOR	
						OSIAN	
						PHALODI	
						PIPAR CITY	
						SHEKHALA	
						SHERGARH	
						TIWARI	
						JODHPUR_URBAN	
23	KARAULI	6		NADOTI		HINDAUN	
						KARAULI	
						MANDRAIL	
						SAPOTRA	
						TODABHIM	
24	KOTA	6		ITAWA		KHAIRABAD	
				SULTANPUR		SANGOD	
						KOTA_URBAN	
						LADPURA	
25	NAGAUR	14				DEGANA	
					MAKRANA	DIDWANA	
						JAYAL	
						KHEENV SAR	
						KUCHAMAN CITY	
						LADNU	
						NAGAUR	
						MERTA	
						MOLASAR	
						MUNDWA	

S. No	Name of District	Total Number of blocks	Name of Safe blocks	Name of Semi-Critical blocks	Name of Critical blocks	Name of Over-Exploited blocks	Name of Saline blocks
						NAWA	
						PARBATSAR	
						RIYAN BARI	
26	PALI	10				BALI	
			ROHAT	PALI		DESURI	
						JAITARAN	
						KHARCHI (MARWAR JUNC	
						RAIPUR	
						RANI STATION	
						SOJAT	
						SUMERPUR	
27	PRATAPGARH	5	PEEPALKHOONTH		DHARIAWAD	ARNOD	
						CHHOTI SADRI	
						PRATAPGARH	
28	RAJSAMAND	7			KHAMNOR	AMET	
					KUMBHALGARH	BHIM	
						DEOGARH	
						RAILMAGRA	
						RAJSAMAND	
29	SAWAI MADHOPUR	6				BAMANWAS	
						BONLI	
						CHAUTH KA BARWARA	
						GANGAPUR	
						KHANDAR	
						SAWAI MADHOPUR	
30	SIKAR	9		FATEHPUR		DANTA RAMGARH	
						DHOND	
						KHANDELA	
						LACHHMANGARH	
						NEEM KA THANA	
						PATAN	
						PIPRALI	
						SRIMADHOPUR	
31	SIROHI	5		PINDWARA	SIROHI	ABU ROAD	

S. No	Name of District	Total Number of blocks	Name of Safe blocks	Name of Semi-Critical blocks	Name of Critical blocks	Name of Over-Exploited blocks	Name of Saline blocks
						REODAR	
						SHEOGANJ	
32	TONK	6	TODARAISINGH	DEOLI	TONK	MALPURA	
						NIWAI	
						UNIARA	
33	UDAIPUR	17		JHALARA	BHINDAR	BARGAON	
					GIRWA	KOTRA	
					GOGUNDA	LASADIYA	
					JHADOL	MAVLI	
					SALUMBAR	RISHABHDEV	
					KURAWAR	KHERWARA	
					PHALASIYA	SAYRA	
					SARADA		
					SEMARI		

Table X: Comparison of Categories of Assessment Units as Computed on 31.03.2022 and 31.03.2023

S. No.	District	Number of unis		Number of safe units		Number of semi-critical units		Number of critical units		Number of Over-exploited units		Number of saline units	
		31.3.23	31.3.22	30.3.22	31.3.23	30.3.22	31.3.23	30.3.22	31.3.23	30.3.22	31.3.23	31.3.22	
1	AJMER	10	0	0	0	0	0	0	0	9	10	0	0
2	ALWAR	14	0	0	0	0	0	0	0	14	14	0	0
3	BANSWARA	11	6	6	5	5	0	0	0	0	0	0	0
4	BARAN	7	0	0	1	1	2	2	4	4	4	0	0
5	BARMER	17	1	1	2	2	0	0	14	14	14	0	0
6	BHARATPUR	10	0	0	0	0	0	0	10	10	10	0	0
7	BHILWARA	12	0	0	0	0	0	0	12	12	12	0	0
8	BIKANER	8	3	3	1	1	0	0	3	3	3	1	1
9	BUNDI	5	1	1	1	1	0	0	3	3	3	0	0
10	CHITTORGARH	11	0	0	0	0	0	0	11	11	11	0	0
11	CHURU	7	1	1	0	0	0	0	4	4	4	1	1
12	DAUSA	6	0	0	0	0	0	0	6	6	6	0	0
13	DHOLPUR	5	0	0	0	0	0	0	6	6	6	0	0
14	DUNGARPUR	10	8	8	2	2	0	0	0	0	0	0	0
15	GANGANAGAR	9	9	9	0	0	0	0	0	0	0	0	0
16	HANUMANGARH	7	5	5	1	1	0	0	0	0	0	1	1
17	JAIPUR	16	0	0	0	0	0	0	16	16	16	0	0
18	JAISALMER	4	0	0	0	0	0	0	4	4	4	0	0
19	JALORE	8	0	0	0	0	0	1	0	7	8	0	0
20	JHALAWAR	8	0	1	0	1	1	1	7	5	5	0	0
21	JHUNJHUNU	8	0	0	0	0	0	0	8	8	8	0	0
22	JODHPUR	17	0	0	1	1	1	1	15	15	15	0	0
23	KARAULI	6	0	0	1	0	0	1	5	5	5	0	0
24	KOTA	6	0	0	2	2	0	0	4	4	4	0	0
25	NAGAUR	14	0	0	0	0	1	0	13	14	14	0	0
26	PALI	10	1	1	0	1	1	0	8	8	8	0	0
27	PRATAPGARH	5	1	1	0	0	1	1	3	3	3	0	0
28	RAJSAMAND	7	0	0	0	0	2	2	5	5	5	0	0
29	SAWAI MADHOPUR	6	0	0	0	0	0	0	6	6	6	0	0
30	SIKAR	9	0	0	1	0	0	0	8	9	9	0	0
31	SIROHI	5	0	0	1	0	1	1	3	4	4	0	0
32	TONK	6	1	0	1	2	1	1	3	3	3	0	0
33	UDAIPUR	18		0	1	1	11	10	6	7	7	0	0
	TOTAL	302	38	38	22	20	23	22	216	219	219	3	3

Annexure-III: Order of Frame of Permanent SLC for Estimation of Dynamic Ground Water Resources in Rajasthan

Govt. of Rajasthan
Administrative Reforms (Group-3) Department
 No. F.6 (31) ARD/Gr.-3/2020 Jaipur Dated:- 4 JUL 2023

:: Order ::

Sub: Estimation of annual Replenishable ground water resources and Constitution of a permanent State Level Committee for re-estimation of annual replenishable ground water resources.

The last assessment of annual Dynamic ground water resources for the entire country was done on 31.03.2022 based on Methodology framed by the Ground Water Resources Estimation Committee-2015. The central Ground water Board and Central Level Expert Group has recommended to conduct Ground Water Resources Assessment of the state every year.

The already constituted State Level Committee vide Administrative Reforms (Group-3) Department order No. 6(31)AR/Gr.3/2020 Dated 14.02.2022 for the purpose shall remain continue to reassess the Ground Water Resources of the Rajasthan State.

Terms of Reference: The broad terms of Reference of the committee would be as follows:

- I. To estimate annual replenishable ground water resources of the State in accordance with the Ground Water Resources Estimation Methodology-2015 of CGWB.
- II. To estimate the status of utilization of the annual replenishable Ground Water Resources.

Time Frame: This shall be a Permanent Committee for the Approval of Ground Water Assessment Report Annually.

By order of Governor.

(Munni Meena)

Dy. Secretary to Govt.

Signature valid

Digitally signed by Munni Meena
 Designation: Deputy Secretary To
 Government
 Date: 2023.06.29 15:51:25 IST
 Reason: Approved

Copy to the following through Administrative Department for information and necessary action:

1. Principal Secretary to the Hon'ble Governor of Rajasthan, Jaipur.
2. Principal Secretary to the Hon'ble Chief Minister, Rajasthan, Jaipur.
3. P.S. to the Hon'ble Minister, PHED and GWD, Jaipur.
4. P.S. to the Chief Secretary, Rajasthan, Jaipur.
5. P.S. to the Add. Chief Secretary to Ggovt., PHED & GWD, Jaipur.
6. P.S. to the Principal Secretary to Govt., Energy Department, Jaipur.
7. P.S. to Commissioner Industries Department, Jaipur
8. P.S. to commissioner Agriculture Department Jaipur
9. Chief Engineer, SWRPD, JLN Marg, Jaipur
10. Chief Engineer, Water Resources Department, Jaipur.
11. Chief Engineer (HQ), PHED, Jaipur.
12. Chief Engineer (Rural), PHED, Jaipur.
13. Chief Engineer, GWD, Jodhpur.
14. Director, Department of Mines & Geology, Jaipur.
15. General Manager, NABARD, Nehru Palace, Tonk Road, Jaipur.
16. Regional Director, CGWB, Western Region, Jaipur.
17. Deputy Secretary to Govt., GWD, Secretariat, Jaipur along with spare copies of order for delivery to all concerned, Ref. No. 12(18)GWD/2017.
18. Guard File.

Dy. Secretary to Govt.

Signature valid

Digitally signed by Munni Meena
 Designation: Deputy Secretary To
 Government
 Date: 2023.06.29 15:51:25 IST
 Reason: Approved

Dynamic Ground Water Resources of Rajasthan 2023

Annexure –IV: Assessment unit wise Dynamic Ground Water Resources of Rajasthan (as on 31.03.2023)

District	Block	Total Area of Assessment Unit (Ha)	Recharge Worthy Area (Ha)	Recharge from Rainfall-Monsoon Season	Recharge from Other Sources-Monsoon Season	Recharge from Rainfall-Non-Monsoon Season	Recharge from Other Sources-Non-Monsoon Season	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Ground Water Extraction for Irrigation Use	Ground Water Extraction for Industrial Use	Ground Water Extraction for Domestic Use	Total Extraction	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction	Category
				(ham)													%	
AJMER	AJMER_URBAN	6818	6607	202.9	0.8	2.5	29.4	235.6	23.6	212.1	271.8	0	89.68	361.5	89.7	0	170.48	OE
AJMER	ARAIN	119440	89726	2990.2	6.6	0.0	1243.0	4239.8	424.0	3815.8	4478.8	0	133.25	4612.0	133.3	0	120.87	OE
AJMER	BHINAY	121619	95354	3829.8	2.4	0.0	1229.4	5061.6	506.2	4555.5	5488.5	1	81.98	5571.5	82.0	0	122.30	OE
AJMER	JAWAJA	67451	48433	1687.6	239.5	0.0	486.6	2413.6	241.4	2172.3	3227.4	1.0	124.98	3353.4	125.0	0	154.37	OE
AJMER	KEKRI	98592	88967	3635.2	584.1	0.0	1913.1	6132.4	613.2	5519.2	9308.3	3.0	102.20	9413.5	102.2	0	170.56	OE
AJMER	KISHANGARH	124509	101288	3747.2	204.3	101.1	256.1	4308.6	430.9	3877.8	5166.5	26.0	268.88	5461.4	268.9	0	140.84	OE
AJMER	MASOODA	89199	81700	3153.9	216.9	0.0	406.0	3776.7	377.7	3399.0	3622.7	127.0	86.55	3836.2	86.6	0	112.86	OE
AJMER	PEESANGAN_RURAL	123991	110805	5115.2	257.7	0.0	721.3	6094.1	609.4	5484.7	8376.6	5.0	147.43	8529.1	147.4	0	155.51	OE
AJMER	SARWAR	39568	36403	1486.9	158.7	3.7	548.4	2197.7	219.8	1977.9	2511.7	0.0	69.65	2581.4	69.7	0	130.51	OE
AJMER	SHRINAGAR_RURAL	96481	87393	2501.9	267.4	0.0	729.5	3498.8	349.9	3148.9	5010.6	13.0	79.75	5103.3	79.8	0	162.07	OE
ALWAR	BANSUR	66443	60412	7536.1	128.0	237.7	384.2	8285.9	828.6	7457.3	10237.5	4.4	958.13	11200.0	958.1	0	150.19	OE
ALWAR	BEHROR	35169	33460	3408.8	28.9	249.7	347.1	4034.5	403.5	3631.1	7520.2	121.7	1125.48	8767.3	1125.5	0	241.45	OE
ALWAR	KATHUMAR	56999	56324	4255.6	114.6	196.0	343.7	4909.8	491.0	4418.9	9164.2	0.0	548.42	9712.6	548.4	0	219.80	OE
ALWAR	KISHANGARH BAS	52646	41322	4668.4	74.5	187.0	223.7	5153.5	515.4	4638.1	5958.7	15.1	1069.60	7043.4	1069.6	0	151.86	OE
ALWAR	KOTKASIM	34443	30659	4710.2	80.5	257.7	241.7	5290.2	529.0	4761.2	6441.0	0.3	928.01	7369.3	928.0	0	154.78	OE
ALWAR	LAXMANGARH	62395	59052	3395.1	37.6	55.3	375.9	3863.8	386.4	3477.4	8263.4	0.4	940.79	9204.6	940.8	0	264.70	OE
ALWAR	MANDAWAR	57726	54578	7401.7	152.0	305.3	456.1	8315.1	831.5	7483.6	12159.7	182.7	1026.02	13368.5	1026.0	0	178.64	OE
ALWAR	NEEMRANA	37882	32743	3818.1	63.6	167.5	190.9	4240.1	424.0	3816.1	5090.4	730.5	738.21	6559.1	738.2	0	171.88	OE
ALWAR	RAJGARH	103421	45595	2443.7	11.7	27.2	139.5	2622.0	262.2	2359.8	2988.4	19.6	738.48	3746.4	738.5	0	158.76	OE
ALWAR	RAMGARH	61697	56846	5392.6	129.3	204.8	387.8	6114.5	611.5	5503.1	10340.3	505.2	957.04	11802.6	957.0	0	214.47	OE
ALWAR	RENI	39205	33104	2081.0	16.7	23.1	200.0	2320.9	232.1	2088.8	4326.6	0.0	342.35	4668.9	342.4	0	223.52	OE
ALWAR	THANAGAZI	106033	75233	5166.9	27.2	184.4	325.6	5704.2	570.4	5133.8	4565.9	19.0	834.55	5419.5	834.6	0	105.57	OE
ALWAR	TIJARA	67348	61152	6955.6	138.1	247.4	414.7	7755.9	775.6	6980.3	11042.9	1659.0	1332.99	14034.8	1333.0	0	201.06	OE
ALWAR	UMREN	90639	79681	9821.4	59.0	481.9	703.2	11065.4	1106.5	9958.9	15156.1	155.5	2929.68	18241.3	2929.7	0	183.17	OE
BANSWARA	ANANDPURI	33740	32938	955.0	0.0	0.0	737.5	1692.4	169.3	1523.2	1106.6	0.0	225.90	1332.5	225.9	190.66	87.48	SC

District	Block	Total Area of Assessment Unit (Ha)	Recharge Worthy Area (Ha)	Recharge from Rainfall-Monsoon Season	Recharge from Other Sources-Monsoon Season	Recharge from Rainfall-Non-Monsoon Season	Recharge from Other Sources-Non-Monsoon Season	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Ground Water Extraction for Irrigation Use	Ground Water Extraction for Industrial Use	Ground Water Extraction for Domestic Use	Total Extraction	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction	Category
				(ham)													%	
BANSWARA	ARTHOONA	24870	24515	668.2	1.2	0.0	1042.9	1712.2	171.2	1541.0	617.3	0.0	180.82	798.2	180.8	742.86	51.79	safe
BANSWARA	BAGIDORA	30819	29529	845.3	22.5	0.0	948.1	1815.9	181.6	1634.3	1209.5	3.3	165.49	1378.3	165.5	423.57	84.33	SC
BANSWARA	BANSWARA	51675	44883	1251.2	65.8	0.0	2593.7	3910.7	391.1	3519.7	1652.7	0.4	269.35	1922.5	269.4	1597.2	54.62	safe
BANSWARA	CHHOTISARVAN	38337	29495	569.8	150.8	0.0	822.9	1543.5	154.4	1389.1	786.8	0.0	151.27	938.1	151.3	451.08	67.53	Safe
BANSWARA	GANGAR TALAI	21415	20520	580.8	0.0	0.0	243.7	824.5	82.5	742.1	568.3	0.0	43.87	612.1	43.9	129.92	82.49	SC
BANSWARA	GARHI	46185	45529	1275.5	1.8	0.0	1666.5	2943.8	294.4	2649.5	1653.0	0.0	317.70	1970.7	317.7	678.75	74.38	SC
BANSWARA	GATOL	77840	68091	1722.0	11.7	0.0	2197.0	3930.7	393.1	3537.6	1540.1	0.3	314.93	1855.3	314.9	1682.2	52.45	safe
BANSWARA	KUSHALGARH	65180	50789	1056.7	10.1	0.0	618.3	1685.1	168.5	1516.6	1161.4	0.0	200.21	1361.7	200.2	154.97	89.78	SC
BANSWARA	SAJJANGARH	39229	34997	661.6	8.8	0.0	826.9	1497.4	149.7	1347.6	623.1	0.1	233.19	856.3	233.2	491.28	63.54	Safe
BANSWARA	TALWARA	24318	16710	557.3	4.2	0.0	1050.6	1612.1	161.2	1450.9	679.4	0.0	314.45	993.8	314.5	457.09	68.50	safe
BARAN	ANTAH	94901	94900	6224.5	504.6	0.0	6706.5	13435.5	1343.6	12091.9	8591.5	0.0	1602.42	10194.0	1602.4	2305.8	84.30	SC
BARAN	ATRU	86030	84647	4796.1	1609.8	0.0	2730.5	9136.3	913.6	8222.7	13063.0	0.0	1263.14	14326.1	1263.1	0	174.23	OE
BARAN	BARAN	62621	62621	4558.2	819.5	0.0	2949.3	8327.0	832.7	7494.3	13662.2	51.4	1669.55	15383.2	1669.6	0	205.27	OE
BARAN	CHHABRA	79079	77337	4914.4	285.8	0.0	1499.1	6699.3	669.9	6029.3	7995.0	0.0	1036.56	9031.6	1036.6	0	149.79	OE
BARAN	CHHIPABAROD	82876	80450	4600.1	462.5	0.0	1463.8	6526.4	652.6	5873.7	7806.7	0.0	907.68	8714.3	907.7	0	148.36	OE
BARAN	KISHANGANJ	143098	142972	7674.5	960.2	0.0	3352.3	11987.0	1198.7	10788.3	9599.6	0.0	691.24	10290.9	691.2	497.38	95.39	C
BARAN	SHAHBAD	146926	146294	6992.7	511.5	0.0	1366.8	8871.0	443.6	8427.4	6693.7	51.1	1194.06	7938.9	1194.1	488.56	94.20	C
BARMER	BALOTRA	156883	156883	1161.0	29.8	0.0	78.6	1269.5	126.9	1142.5	2169.1	426.0	302.49	2897.6	302.5	0	253.61	OE
BARMER	BARMER	241209	241209	2321.6	28.3	8.4	85.0	2443.4	244.3	2199.0	2267.8	12.0	657.56	2937.3	657.6	0	133.57	OE
BARMER	BAYTOO	140758	140758	363.2	7.4	0.0	22.3	392.9	39.3	353.6	593.3	0.0	262.88	856.2	262.9	0	242.15	OE
BARMER	CHOHTAN	180275	180275	3102.3	20.3	0.0	61.0	3183.7	318.4	2865.3	1626.0	0.0	244.89	1870.9	244.9	994.39	65.30	safe
BARMER	DHANA00	124474	124474	3491.5	35.3	0.0	105.8	3632.6	363.3	3269.3	2822.5	0.0	523.80	3346.3	523.8	0	102.35	OE
BARMER	DHORIMANNA	165986	165986	3019.0	78.4	0.0	235.1	3332.4	333.3	2999.2	6268.8	0.0	625.74	6894.5	625.7	0	229.88	OE
BARMER	GADRAROAD	392564	392564	1067.0	7.7	31.0	26.0	1131.6	113.2	1018.5	673.7	0.0	644.31	1318.0	644.3	0	129.41	OE
BARMER	GIRA	155036	155036	74.8	2.0	0.0	7.3	84.1	8.4	75.7	185.6	0.0	49.80	235.4	49.8	0	311.10	OE
BARMER	GUDHAMALANI	128265	128265	3772.8	219.7	0.0	659.0	4651.5	465.2	4186.4	3514.8	0.0	743.67	4258.5	743.7	0	101.72	OE

Dynamic Ground Water Resources of Rajasthan 2023

District	Block	Total Area of Assessment Unit (Ha)	Recharge Worthy Area (Ha)	Recharge from Rainfall-Monsoon Season	Recharge from Other Sources-Monsoon Season	Recharge from Rainfall-Non-Monsoon Season	Recharge from Other Sources-Non-Monsoon Season	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Ground Water Extraction for Irrigation Use	Ground Water Extraction for Industrial Use	Ground Water Extraction for Domestic Use	Total Extraction	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction	Category
				(ham)													%	
BARMER	KALYANPUR	126304	126304	1155.1	12.6	0.0	42.7	1210.4	121.0	1089.4	718.4	0.0	63.48	781.9	63.5	307.53	71.77	SC
BARMER	PATODI	83162	83162	1231.4	40.0	0.0	137.3	1408.7	140.9	1267.8	1042.9	0.0	89.82	1132.8	89.8	135.06	89.35	SC
BARMER	RAMSAR	158707	158707	680.7	7.1	2.5	21.4	711.7	71.2	640.6	571.2	0.0	132.63	703.8	132.6	0	109.88	OE
BARMER	SAMDARI	83687	83687	1353.3	15.1	0.0	45.3	1413.6	141.4	1272.3	1207.2	0.0	419.94	1627.2	419.9	0	127.89	OE
BARMER	SERWA	170357	170357	3117.4	40.1	0.0	120.3	3277.8	327.8	2950.0	3207.4	0.0	422.46	3629.8	422.5	0	123.05	OE
BARMER	SHEO	266379	266379	1133.8	42.2	32.9	125.4	1334.3	133.4	1200.9	3352.6	0.0	1009.50	4362.1	1009.5	0	363.24	OE
BARMER	SINDHARI	162984	162984	3215.3	40.9	0.0	116.9	3373.1	337.3	3035.7	3155.0	0.0	533.82	3688.8	533.8	0	121.51	OE
BARMER	SIWANA	120828	120828	5281.6	56.2	0.0	165.3	5503.0	550.3	4952.7	4429.2	0.0	679.50	5108.7	679.5	0	103.15	OE
BHARATPUR	BAYANA	80869	67631	6763.8	427.3	203.8	1031.3	8426.2	842.6	7583.6	6527.6	58.4	1119.21	7705.2	1119.2	0	101.60	OE
BHARATPUR	DEEG	49285	47082	3063.5	186.2	94.0	711.1	4054.8	405.5	3649.3	3329.4	0.0	370.95	3700.3	371.0	0	101.40	OE
BHARATPUR	KAMAN	35029	35029	2853.2	175.6	141.9	622.9	3793.7	379.4	3414.3	3001.3	0.0	452.83	3454.1	452.8	0	101.17	OE
BHARATPUR	KUMHER	45451	45420	1167.4	89.2	31.8	308.8	1597.2	159.7	1437.5	1416.5	0.0	644.08	2060.6	644.1	0	143.35	OE
BHARATPUR	NADBAI	44670	44670	2143.8	42.2	77.6	163.9	2427.5	121.4	2306.2	3236.8	3.4	692.08	3932.2	692.1	0	170.51	OE
BHARATPUR	NAGAR	46937	42073	2109.1	23.0	106.0	70.3	2308.3	230.8	2077.5	1805.3	3.1	317.01	2125.4	317.0	0	102.31	OE
BHARATPUR	PAHARI	33295	33295	2517.3	170.9	122.9	589.1	3400.1	340.0	3060.1	3726.7	0.0	269.06	3995.8	269.1	0	130.58	OE
BHARATPUR	RUPBAS	53901	50110	3610.9	217.8	87.9	895.7	4812.2	240.6	4571.6	5849.6	2.7	472.15	6324.4	472.2	0	138.34	OE
BHARATPUR	SEWAR	50952	50937	2706.9	293.7	83.3	965.7	4049.6	202.5	3847.2	4283.1	1.2	834.58	5118.9	834.6	0	133.06	OE
BHARATPUR	WEIR	60653	58905	4410.6	66.0	79.3	243.8	4799.6	480.0	4319.7	4155.8	3.1	1219.88	5378.8	1219.9	0	124.52	OE
BHILWARA	ASIND	113610	99046	2428.2	0.5	0.0	954.1	3382.7	322.2	3060.5	5119.0	0.0	384.93	5503.9	384.9	0	179.83	OE
BHILWARA	BANERA	68780	66258	2644.1	1.6	0.0	649.5	3295.2	329.5	2965.7	3256.1	34.2	276.45	3566.8	276.5	0	120.27	OE
BHILWARA	BIJOLIYAN	73734	54126	2299.5	17.2	0.0	803.6	3120.2	312.0	2808.2	3135.2	0.0	230.83	3366.0	230.8	129.4	119.86	OE
BHILWARA	HURDA	62180	61276	1640.2	4.6	0.0	628.7	2273.5	227.4	2046.2	2772.4	44.0	216.08	3032.5	216.1	155.1	148.20	OE
BHILWARA	JAHAZPUR	108970	86587	3120.0	4.3	0.0	1381.6	4505.9	450.6	4055.3	6926.7	0.0	297.11	7223.8	297.1	0	178.13	OE
BHILWARA	KOTRI	93400	89831	3404.3	19.2	0.0	1574.6	4998.1	499.8	4498.3	5616.0	4.5	340.14	5960.6	340.1	69.24	132.51	OE
BHILWARA	MANDAL	123420	115595	3826.4	1.9	0.0	1183.9	5012.2	501.2	4511.0	7001.8	26.7	390.65	7419.2	390.7	0	164.47	OE
BHILWARA	MANDALGARH	76176	49147	1984.7	26.7	0.0	1907.1	3918.5	391.9	3526.6	5977.6	0.0	684.01	6661.6	684.0	247.86	188.89	OE

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				(ham)													%	
BHILWARA	RAIPUR	52420	48636	1736.7	4.5	0.0	758.1	2499.3	249.9	2249.4	3975.1	0.0	410.03	4385.1	410.0	27.48	194.95	OE
BHILWARA	SAHARA	65390	63469	1750.0	0.4	0.0	391.1	2141.4	214.1	1927.3	2832.2	0.7	678.90	3511.9	678.9	37.51	182.22	OE
BHILWARA	SHAHUPURA	115930	112513	3276.5	17.6	0.0	2379.5	5673.6	567.4	5106.3	7564.6	0.1	273.40	7838.1	273.4	28.68	153.50	OE
BHILWARA	SUWANA	91490	89001	3209.6	1.8	0.0	1077.5	4288.9	428.9	3860.0	6036.6	625.6	1189.94	7852.1	1189.9	0	203.42	OE
BIKANER	BIKANER_RURAL	368363	368363	6115.3	359.5	955.5	757.8	8188.0	742.6	7445.4	7750.4	35.0	1787.84	9573.2	1787.8	1447.9	128.58	OE
BIKANER	BIKANER_URBAN	14113	14113	165.4	22.4	24.2	64.9	276.9	27.7	249.2	70.2	2.0	57.60	129.8	57.6	119.39	52.09	safe
BIKANER	DUNGARGARH	300390	300390	4894.5	140.5	644.0	421.5	6100.4	610.0	5490.4	11240.4	0.0	2349.60	13590.0	2349.6	0	247.52	OE
BIKANER	KHAJUWALA	545324	545324	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0		saline
BIKANER	KOLAYAT	797086	797086	3780.9	13.9	616.0	41.8	4452.6	445.3	4007.3	1113.4	24.0	1357.44	2494.8	1357.4	1512.4	62.26	safe
BIKANER	LUNKARANSAR	632802	632802	3126.3	98.8	605.7	215.1	4045.9	404.6	3641.3	1614.6	0.0	581.30	2195.9	581.3	1445.4	60.30	Safe
BIKANER	NOKHA	188810	188810	3211.2	59.7	178.4	179.1	3628.3	362.8	3265.5	4774.8	10.0	2147.60	6932.4	2147.6	0	212.29	OE
BIKANER	PANCHOO	191289	191289	3881.2	0.0	214.4	95.0	4190.5	419.1	3771.4	1899.1	0.0	1424.56	3323.7	1424.6	447.76	88.13	SC
BUNDI	BUNDI	117513	77311	2594.5	220.5	0.0	3411.5	6226.5	622.6	5603.8	5123.2	22.0	482.37	5627.6	482.4	329.93	100.42	OE
BUNDI	HINDOLI	127530	88481	3416.7	78.2	0.0	2912.5	6407.3	320.4	6086.9	8219.1	0.0	996.18	9215.3	996.2	282.84	151.39	OE
BUNDI	KESHORAI PATAN	124351	115288	4197.0	279.1	0.0	4276.1	8752.2	875.2	7877.0	5324.2	11.0	669.32	6004.5	669.3	1872.5	76.23	safe
BUNDI	NAINWA	109519	96685	4884.2	367.0	0.0	1650.0	6901.2	347.7	6553.5	6749.4	17.0	1381.78	8148.2	1381.8	46.53	124.33	OE
BUNDI	TALERA	71087	46253	2676.2	350.8	0.0	1751.7	4778.7	477.9	4300.8	1876.2	16.0	193.73	2086.0	193.7	2214.8	48.50	safe
CHITTAURGARH	BARI SADRI	50468	42838	1387.1	134.1	0.0	633.2	2154.3	215.5	1938.9	3353.9	0.0	234.69	3588.6	234.7	0	185.09	OE
CHITTAURGARH	BEGUN	97035	62685	2881.2	273.7	0.0	1403.2	4558.1	455.8	4102.3	6348.2	41.1	152.81	6542.1	152.8	0	159.47	OE
CHITTAURGARH	BHADESAR	53906	49253	1843.5	136.2	0.0	1040.4	3020.1	302.0	2718.1	5077.6	0.0	78.33	5156.0	78.3	0	189.69	OE
CHITTAURGARH	BHAINSRORGARH	160546	77936	2767.5	184.1	0.0	754.5	3706.0	370.6	3335.4	4023.0	0.0	34.72	4057.7	34.7	0	121.66	OE
CHITTAURGARH	BHOPALSAGAR	39824	38212	1157.4	75.2	0.0	406.2	1638.8	163.9	1474.9	2540.4	2.9	77.55	2620.9	77.6	0	177.70	OE
CHITTAURGARH	CHITTAURGARH	95133	48021	2534.8	151.5	0.0	1353.8	4040.0	404.0	3636.0	6178.1	46.6	829.64	7054.4	829.6	0	194.02	OE
CHITTAURGARH	DUNGLA	49400	46543	1556.9	137.6	0.0	666.5	2361.0	236.1	2124.9	3309.1	1.3	61.80	3372.2	61.8	0	158.70	OE
CHITTAURGARH	GANGRAR	55564	53662	2215.1	46.2	0.0	471.2	2732.5	273.3	2459.2	3282.7	12.0	42.23	3337.0	42.2	0	135.69	OE
CHITTAURGARH	KAPASAN	51592	50201	1389.6	108.8	0.0	476.8	1975.2	197.5	1777.7	2878.3	0.4	147.97	3026.6	148.0	0	170.25	OE

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CHITTAURGARH	NIMBAHERA	89535	70281	4285.3	273.5	0.0	1774.7	6333.5	633.3	5700.1	6591.7	3.0	284.23	6878.9	284.2	123.48	120.68	OE
CHITTAURGARH	RASHMI	44997	43757	1486.9	121.6	0.0	425.4	2033.9	203.4	1830.5	2929.3	0.0	84.23	3013.6	84.2	0.1	164.63	OE
CHURU	BIDASAR	113878	113878	3006.4	0.0	239.9	162.0	3408.3	340.8	3067.5	4319.7	0.0	411.62	4731.3	411.6	0	154.24	OE
CHURU	CHURU	160687	160687	1003.2	1.8	162.8	16.3	1184.1	118.4	1065.7	580.7	0.9	515.95	1097.6	516.0	0	103.00	OE
CHURU	RAJGARH	222492	222492	2126.4	16.3	235.5	146.6	2524.8	126.2	2398.5	5211.0	0.0	535.11	5746.1	535.1	0	239.57	OE
CHURU	RATANGARH	162241	162241	2352.9	0.0	203.0	70.7	2626.5	262.7	2363.9	1884.0	2.9	605.97	2492.9	606.0	0	105.46	OE
CHURU	SARDARSHAHAR	386080	386080	4729.5	0.0	565.0	83.9	5378.4	268.9	5109.4	2238.0	0.1	883.03	3121.1	883.0	1988.3	61.09	safe
CHURU	SUJANGARH	152883	152883	761.6	3.7	72.9	33.4	871.7	87.2	784.5	1186.3	0.8	234.27	1421.3	234.3	0	181.18	OE
CHURU	TARANAGAR	181040	181040	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0		saline
DAUSA	BANDIKUI	63294	52890	4057.4	40.1	24.8	346.2	4468.6	446.9	4021.7	6926.0	0.3	3247.54	10173.8	3247.5	0	252.97	OE
DAUSA	DAUSA	78311	73409	4719.0	381.1	7.4	290.1	5397.5	539.8	4857.8	5849.0	0.0	3092.03	8941.0	3092.0	0	184.06	OE
DAUSA	LALSOT	87124	78036	6880.3	333.2	0.0	862.1	8075.6	807.6	7268.1	17365.7	1.1	1778.56	19145.4	1778.6	0	263.42	OE
DAUSA	LAWAN	16065	16065	1112.0	0.5	0.0	114.6	1227.1	122.7	1104.4	2301.7	0.0	516.76	2818.4	516.8	0	255.20	OE
DAUSA	MAHWA	47000	44200	3661.8	88.3	77.3	435.6	4262.9	426.3	3836.6	8712.4	1.2	844.73	9558.3	844.7	0	249.14	OE
DAUSA	SIKRAI	50223	43962	3950.9	155.6	71.2	318.2	4495.8	449.6	4046.2	6367.0	0.5	1615.52	7983.0	1615.5	0	197.30	OE
DHAULPUR	BARI	81624	69467	5177.7	350.7	316.0	1321.9	7166.2	435.7	6730.5	6268.8	3.5	993.08	7265.4	993.1	606.35	107.95	OE
DHAULPUR	BASERI	100142	81390	5393.1	461.2	299.2	1742.8	7896.3	789.6	7106.6	6263.2	0.0	991.78	7254.9	991.8	0	102.09	OE
DHAULPUR	DHAULPUR	28493	23997	2486.6	264.1	126.7	991.9	3869.2	386.9	3482.3	5639.6	10.5	979.89	6629.9	979.9	0	190.39	OE
DHAULPUR	RAJAKHERA	58207	48872	4653.7	42.5	238.3	548.6	5483.2	548.3	4934.9	6648.3	1.7	934.77	7584.8	934.8	0	153.70	OE
DHAULPUR	SAIPU	32439	24800	2253.0	161.3	97.9	582.5	3094.7	309.5	2785.3	4597.9	0.0	716.05	5313.9	716.1	0	190.79	OE
DUNGARPUR	ASPUR	32807	26540	819.6	379.9	0.0	1542.2	2741.6	274.2	2467.4	679.8	0.5	76.13	756.4	76.1	1711.0	30.65	safe
DUNGARPUR	BICHHIWARA	89812	62253	2368.1	30.0	0.0	1024.5	3422.6	342.3	3080.3	1458.6	0.1	144.51	1603.2	144.5	1477.1	52.05	safe
DUNGARPUR	CHEEKHLI	26382	18430	462.1	168.0	0.0	1292.5	1922.6	192.3	1730.3	916.5	0.2	46.73	963.4	46.7	766.88	55.68	safe
DUNGARPUR	DOVRA	30706	20569	675.7	1.8	0.0	607.8	1285.4	128.5	1156.8	865.4	0.0	91.73	957.1	91.7	199.68	82.74	SC
DUNGARPUR	DUNGARPUR	13143	9181	305.3	118.1	0.0	706.2	1129.6	113.0	1016.6	575.0	0.0	90.41	665.4	90.4	351.22	65.45	safe
DUNGARPUR	GALIAKOT	25426	17762	628.8	112.8	0.0	1453.4	2195.0	219.5	1975.5	1183.7	0.0	37.05	1220.7	37.1	754.77	61.79	safe

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DUNGARPUR	JHONTHRI	26971	18798	671.9	0.9	0.0	189.8	862.6	86.3	776.3	237.5	0.0	35.07	272.6	35.1	503.74	35.11	safe
DUNGARPUR	SABLA	35781	23384	619.8	318.4	0.0	625.7	1563.8	134.6	1429.3	517.3	0.0	77.56	594.9	77.6	834.37	41.62	safe
DUNGARPUR	SAGWARA	58397	40194	1648.0	128.0	0.0	3623.4	5399.4	539.9	4859.5	3758.4	0.4	204.08	3962.9	204.1	896.58	81.55	SC
DUNGARPUR	SIMALWARA	37652	26302	863.9	80.9	0.0	999.2	1944.0	194.4	1749.6	1035.6	0.0	81.98	1117.6	82.0	632	63.88	safe
GANGANAGAR	ANUPGARH	114935	114935	693.6	6341.2	165.3	2701.1	9901.3	990.1	8911.1	1014.1	0.0	1.47	1015.6	1.5	7895.5	11.40	safe
GANGANAGAR	GANGANAGAR	86670	86670	885.9	2213.8	196.2	7819.8	11115.7	1111.6	10004.2	6765.7	0.0	6.37	6772.1	6.4	3232.0	67.69	safe
GANGANAGAR	GHADSANA	138732	138732	341.5	912.9	80.4	1367.4	2702.2	270.2	2432.0	437.8	0.0	0.42	438.2	0.4	1993.8	18.02	safe
GANGANAGAR	KARANPUR	82680	82680	841.9	1040.7	135.8	3310.3	5328.8	532.9	4795.9	2529.5	0.0	5.39	2534.8	5.4	2261.0	52.85	safe
GANGANAGAR	PADAMPUR	84690	84690	566.2	1647.7	119.8	3847.2	6180.9	618.1	5562.8	2826.4	0.0	4.62	2831.0	4.6	2731.8	50.89	safe
GANGANAGAR	RAISINGHNAGAR	131668	131668	255.5	735.0	45.7	1699.5	2735.8	273.6	2462.2	1195.2	29.0	1.96	1226.2	2.0	1236.0	49.80	safe
GANGANAGAR	SADULSHAHAHAR	89270	89270	132.6	621.6	22.3	1303.9	2080.4	208.0	1872.4	481.0	6.0	0.00	487.0	0.0	1385.3	26.01	safe
GANGANAGAR	SRI VIJAYNAGAR	83786	83786	688.6	1702.3	145.6	2673.2	5209.7	521.0	4688.8	489.7	0.0	0.70	490.4	0.7	4198.3	10.46	safe
GANGANAGAR	SURATGARH	301728	301728	366.0	1033.8	92.2	1220.1	2712.0	271.2	2440.8	1249.8	4.0	17.64	1271.5	17.6	1169.3	52.09	safe
HANUMANGARH	BHADRA	177680	177680	1037.1	591.3	124.0	1434.1	3186.5	318.7	2867.9	1525.1	10.0	280.00	1815.1	280.0	1052.7	63.29	safe
HANUMANGARH	HANUMANGARH	111238	111238	881.2	1713.3	185.7	1300.8	4081.0	408.1	3672.9	2093.2	10.0	157.50	2260.7	157.5	1412.1	61.55	safe
HANUMANGARH	NOHAR	243945	243945	320.4	545.6	48.7	582.2	1497.0	149.7	1347.3	762.6	0.0	16.10	778.7	16.1	568.56	57.80	safe
HANUMANGARH	PILIBANGA	112802	112802	1429.6	1957.1	305.2	442.5	4134.5	413.5	3721.0	2426.0	0.0	236.25	2662.3	236.3	1058.7	71.55	SC
HANUMANGARH	RAWATSAR	167225	167225	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0		saline
HANUMANGARH	SANGARIYA	69319	69319	721.6	1316.7	143.5	1904.8	4086.5	408.7	3677.9	1680.7	0.0	76.30	1757.0	76.3	1920.9	47.77	safe
HANUMANGARH	TIBI	75751	75751	823.0	1800.2	222.8	2658.8	5504.8	550.5	4954.3	2760.1	180.0	148.75	3088.9	148.8	1865.4	62.35	safe
JAIPUR	AMBER_RURAL	43718	42288	3610.8	86.9	0.0	273.4	3971.1	397.1	3573.9	6409.3	287.5	1661.45	8358.2	1661.5	0	233.86	OE
JAIPUR	BASSI	65469	63123	4771.6	102.8	121.2	372.6	5368.1	536.8	4831.3	9006.8	60.5	3313.66	12381.0	3313.7	0	256.27	OE
JAIPUR	CHAKSU	81192	72936	4377.8	504.7	0.1	1649.3	6531.9	653.2	5878.8	13640.4	3.7	1238.61	14882.7	1238.6	0	253.16	OE
JAIPUR	DUDU	187064	179087	4619.6	494.2	0.0	1110.1	6223.9	622.4	5601.5	5285.1	86.7	2953.53	8325.3	2953.5	0	148.63	OE
JAIPUR	GOVINDGARH	68512	63808	4676.4	37.4	16.0	641.0	5370.8	537.1	4833.7	13566.9	53.1	1985.43	15605.5	1985.4	0	322.85	OE
JAIPUR	JAIPUR_URBAN	38141	35522	1243.0	0.0	28.1	0.0	1271.1	127.1	1144.0	0.0	244.8	3662.09	3906.9	3662.1	0	341.52	OE

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JAIPUR	JALSOO	45121	41865	3860.1	69.1	0.0	288.0	4217.2	421.7	3795.5	7142.6	0.0	1633.43	8776.0	1633.4	0	231.22	OE
JAIPUR	JAMWA RAMGARH	103370	96188	5846.3	113.1	132.8	251.1	6343.3	634.3	5709.0	5309.0	10.3	3662.82	8982.1	3662.8	0	157.33	OE
JAIPUR	JHOTWARA_RURAL	30528	30158	2541.8	53.5	57.5	222.8	2875.6	287.6	2588.0	5525.6	1.0	615.31	6141.9	615.3	0	237.32	OE
JAIPUR	KOTPUTLI	41308	34210	2744.1	71.2	166.3	296.8	3278.4	327.9	2950.6	7359.8	430.0	669.30	8459.1	669.3	0	286.69	OE
JAIPUR	PAOTA	44780	39368	2392.3	58.9	174.0	245.6	2870.9	287.1	2583.8	6090.9	0.0	1033.18	7124.1	1033.2	0	275.72	OE
JAIPUR	PHAGI	111434	111357	3869.3	445.4	32.9	1362.6	5710.1	571.0	5139.1	4449.8	30.7	1358.22	5838.7	1358.2	0	113.61	OE
JAIPUR	SAMBHAR	93840	83148	5559.6	23.3	111.1	420.8	6114.7	611.5	5503.3	8577.3	0.6	5119.61	13697.5	5119.6	0	248.90	OE
JAIPUR	SANGANER_RURAL	54989	51904	3540.6	3.0	39.5	154.6	3737.8	373.8	3364.0	3152.5	417.0	4568.56	8138.0	4568.6	0	241.92	OE
JAIPUR	SHAHUPURA	42985	38020	3504.6	57.7	64.5	240.4	3867.2	386.7	3480.5	5962.8	18.6	4222.87	10204.3	4222.9	0	293.19	OE
JAIPUR	VIRATNAGAR	53693	50490	4366.7	83.0	145.0	240.5	4835.2	483.5	4351.7	5526.3	18.3	1228.96	6773.5	1229.0	0	155.65	OE
JAISALMER	JAISALMER_RURAL	1144033	1144033	2806.6	137.6	163.1	412.7	3519.9	352.0	3167.9	11004.6	0.0	1341.77	12346.4	1341.8	0	389.73	OE
JAISALMER	JAISALMERURBAN	6467	6467	53.4	1.1	3.1	3.2	60.8	6.1	54.7	84.0	2.3	64.80	151.1	64.8	0	276.39	OE
JAISALMER	SAM	2111100	2111100	2771.0	107.1	152.2	321.4	3351.7	335.2	3016.6	8571.4	0.0	1541.44	10112.8	1541.4	0	335.24	OE
JAISALMER	SANKRA	552900	552900	2857.8	134.5	219.6	403.4	3615.4	361.5	3253.8	10758.4	3.5	993.09	11755.0	993.1	0	361.27	OE
JALOR	AHORE	161377	154124	2859.0	46.9	0.0	161.4	3067.3	306.7	2760.6	3306.3	0.0	316.80	3623.1	316.8	0	131.25	OE
JALOR	BHINMAL	136561	135837	5750.2	137.8	0.0	413.4	6301.5	315.1	5986.4	11024.6	0.1	822.24	11846.9	822.2	0	197.90	OE
JALOR	CHITALWANA	181785	181785	3938.5	327.4	0.0	3487.0	7752.9	775.3	6977.7	6647.0	0.0	58.20	6705.2	58.2	272.41	96.10	C
JALOR	JALORE	104905	98193	4433.1	74.7	0.0	235.9	4743.7	474.4	4269.3	6210.8	0.0	599.16	6810.0	599.2	0	159.51	OE
JALOR	JASWANTPURA	105842	93237	4279.9	56.3	0.0	237.5	4573.7	228.7	4345.0	5875.3	0.2	456.60	6332.1	456.6	0	145.73	OE
JALOR	RANIWARA	100975	91862	6232.4	168.8	0.0	506.4	6907.6	690.8	6216.9	13505.1	2.1	854.28	14361.5	854.3	0	231.01	OE
JALOR	SANCHORE	123712	123690	5841.1	132.0	0.0	2399.7	8372.7	753.0	7619.7	10519.6	0.0	222.00	10741.6	222.0	0	140.97	OE
JALOR	SAYLA	148843	146425	5332.1	257.3	0.0	640.0	6229.5	622.9	5606.5	17947.7	0.2	1078.92	19026.8	1078.9	0	339.37	SC
JHALAWAR	AKLERA	79165	70165	4831.9	321.0	0.0	963.0	6115.9	611.6	5504.3	5136.0	0.0	366.83	5502.9	366.8	1.45	99.97	C
JHALAWAR	BAKANI	46412	46412	3578.5	37.0	0.0	1407.2	5022.7	486.3	4536.5	5452.8	0.3	817.23	6270.4	817.2	0	138.22	OE
JHALAWAR	BHAWANI MANDI	72780	70280	4392.5	270.1	0.0	803.4	5466.1	546.6	4919.5	4294.3	0.0	289.67	4584.0	289.7	335.52	93.18	C
JHALAWAR	DAG	91681	88781	6051.0	560.3	0.0	1770.1	8381.3	838.1	7543.2	9158.1	0.0	643.68	9801.8	643.7	0	129.94	OE

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JHALAWAR	JHALRAPATAN	81126	81126	5001.1	144.8	0.0	2323.1	7468.9	746.9	6722.1	9034.9	0.1	467.94	9503.0	467.9	0.08	141.37	OE
JHALAWAR	KHANPUR	93967	90971	5781.7	1082.7	0.0	4132.4	10996.8	1099.7	9897.1	13334.8	0.0	309.86	13644.7	309.9	0	137.87	OE
JHALAWAR	MANOHAR THANA	64087	64087	3622.6	267.6	0.0	798.0	4688.1	290.0	4398.1	4241.0	0.0	515.91	4756.9	515.9	1655.8	108.16	OE
JHALAWAR	PIRAWA	104504	97804	6457.9	216.5	0.0	813.5	7487.9	713.2	6774.8	4031.4	0.0	545.70	4577.1	545.7	2507.5	67.56	Safe
JHUNJHUNU	ALSISAR	82715	82715	2578.4	15.3	222.8	76.5	2893.0	289.3	2603.7	1835.5	1.6	985.44	2822.6	985.4	0	108.41	OE
JHUNJHUNU	BUHANA	65114	62430	2206.7	22.9	188.3	114.7	2532.6	253.3	2279.3	2752.3	0.0	1489.38	4241.7	1489.4	0	186.09	OE
JHUNJHUNU	CHIRAWA	49304	49304	1891.4	33.4	206.1	166.8	2297.6	229.8	2067.9	4003.4	0.0	1571.98	5575.4	1572.0	0	269.62	OE
JHUNJHUNU	JHUNJHUNUN	75190	74496	2403.4	50.7	220.2	253.3	2927.6	292.8	2634.8	6079.2	23.6	1678.34	7781.1	1678.3	0	295.32	OE
JHUNJHUNU	KHETRI	81944	57583	2754.0	22.6	167.1	112.9	3056.6	305.7	2750.9	2710.1	22.2	1555.91	4288.2	1555.9	0	155.88	OE
JHUNJHUNU	NAWALGARH	69680	63200	2592.3	50.3	170.7	251.7	3065.1	306.5	2758.6	6041.9	206.1	1494.89	7742.8	1494.9	0	280.68	OE
JHUNJHUNU	SURAJGARH	77909	77909	2698.8	44.4	339.5	222.1	3304.7	330.5	2974.3	5329.9	0.0	1444.09	6774.0	1444.1	0	227.76	OE
JHUNJHUNU	UDAIPURWATI	86728	71710	3921.8	55.4	219.9	276.9	4473.9	447.4	4026.5	6644.4	310.7	1691.99	8647.0	1692.0	0	214.75	SC
JODHPUR	BALESAR	87095	86095	711.4	23.9	10.9	71.6	817.8	81.8	736.0	1909.9	0.0	512.00	2421.9	512.0	0	329.07	OE
JODHPUR	BAORI	114906	114906	2441.0	104.4	27.7	313.3	2886.4	288.7	2597.8	8354.5	0.5	1560.00	9915.0	1560.0	0	381.67	OE
JODHPUR	BAP	383390	383390	3056.3	29.5	235.1	83.0	3403.9	170.2	3233.7	2249.2	38.9	921.60	3209.6	921.6	24.11	99.25	C
JODHPUR	BAPINI	126020	126020	2076.0	64.9	56.3	194.8	2392.0	119.6	2272.4	5193.6	0.0	2304.64	7498.2	2304.6	0	329.97	OE
JODHPUR	BHOPALGARH	120584	120584	3293.8	79.3	0.0	237.8	3610.8	361.1	3249.8	6340.7	62.9	652.20	7055.8	652.2	0	217.12	OE
JODHPUR	BILARA	101279	101279	3011.0	77.0	0.0	248.9	3336.9	333.7	3003.2	6519.2	0.0	489.76	7009.0	489.8	0	233.38	OE
JODHPUR	DECHOO	127348	127348	2581.2	64.0	51.8	192.0	2889.0	288.9	2600.1	5121.4	0.0	1329.60	6451.0	1329.6	0	248.10	OE
JODHPUR	JODHPUR_URBAN	24790	23523.77	425.3	22.3	0.0	49.4	497.0	49.7	447.3	134.2	16.7	323.88	474.7	323.9	0	106.13	OE
JODHPUR	LOHAWAT	122420	122420	2033.3	69.9	49.9	209.7	2362.8	236.3	2126.5	5592.2	0.0	1427.20	7019.4	1427.2	0	330.09	OE
JODHPUR	LUNI	197895	197895	2196.0	15.0	0.0	45.0	2256.0	112.8	2143.2	1200.1	555.0	113.92	1869.1	113.9	274.11	87.21	SC
JODHPUR	MANDOR_RURAL	101306	97544.23	940.9	24.9	0.0	74.8	1040.6	52.0	988.6	1994.9	0.0	74.88	2069.8	74.9	0	209.37	OE
JODHPUR	OSIAN	106467	106467	1974.0	75.5	30.7	226.4	2306.6	230.7	2075.9	6036.1	0.0	2006.40	8042.5	2006.4	0	387.42	OE
JODHPUR	PHALODI	186601	186601	2487.7	98.5	154.6	295.6	3036.4	303.6	2732.8	7882.4	3.7	950.40	8836.5	950.4	0	323.35	OE
JODHPUR	PIPAR CITY	120970	120970	2498.1	67.4	0.0	217.1	2782.6	278.3	2504.3	5689.9	0.0	352.16	6042.1	352.2	0	241.27	OE

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JODHPUR	SHEKHALA	95309	95309	1606.6	61.7	31.4	185.2	1885.0	94.3	1790.7	4939.2	0.0	1275.84	6215.0	1275.8	0	347.07	OE
JODHPUR	SHERGARH	120888	120888	2526.0	28.7	48.2	85.7	2688.6	268.9	2419.8	2287.9	0.0	564.80	2852.7	564.8	0	117.89	OE
JODHPUR	TIWARI	87732	87732	1621.3	87.9	39.9	263.7	2012.8	201.3	1811.5	7031.0	0.0	295.68	7326.7	295.7	0	404.46	OE
KARAULI	HINDAUN	63770	57520	4122.3	340.5	25.7	1512.7	6001.2	600.1	5401.1	12179.0	0.1	1006.01	13185.1	1006.0	0	244.12	OE
KARAULI	KARAULI	126209	108446	8209.1	1.5	100.3	1938.4	10249.4	1025.0	9224.5	8699.5	0.0	1164.57	9864.0	1164.6	0	106.93	OE
KARAULI	MANDRAIL	63430	49341	3680.0	22.7	1.2	334.2	4038.1	403.8	3634.2	3360.8	0.0	581.98	3942.8	582.0	0	108.49	OE
KARAULI	NADOTI	65050	57106	2726.6	61.2	19.3	330.9	3138.0	186.6	2951.4	1654.4	0.0	562.98	2217.3	563.0	1681.3	75.13	SC
KARAULI	SAPOTRA	195881	72608	5542.5	46.8	0.0	486.5	6075.7	607.6	5468.2	8423.8	0.0	631.19	9055.0	631.2	0	165.59	OE
KARAULI	TODABHIM	52950	45221	3799.0	0.1	58.7	457.4	4315.1	431.5	3883.6	9149.0	0.0	890.13	10039.2	890.1	0	258.50	OE
KOTA	ITAWA	89851	89751	6210.4	469.4	0.0	6746.4	13426.2	1342.6	12083.6	9233.7	0.0	1056.28	10290.0	1056.3	1793.5	85.16	SC
KOTA	KHAIRABAD	79426	75060	4765.3	264.9	0.0	946.0	5976.2	597.6	5378.5	5042.2	0.3	1361.55	6404.0	1361.6	0	119.07	OE
KOTA	KOTA_URBAN	62651	62628	1922.9	90.9	0.0	348.1	2361.8	236.2	2125.6	1401.7	34.0	1097.99	2533.7	1098.0	216.7	119.20	SC
KOTA	LADPURA_RURAL	91429	89507	4227.8	437.0	0.0	994.2	5659.0	565.9	5093.1	3401.3	94.2	2282.36	5777.8	2282.4	70.21	113.44	OE
KOTA	SANGOD	105780	104414	5173.4	1272.7	0.0	4646.6	11092.8	1109.3	9983.5	13514.2	0.0	1338.65	14852.9	1338.7	714.51	148.77	OE
KOTA	SULTANPUR	91257	90957	6739.4	567.7	0.0	5752.2	13059.3	1305.9	11753.3	7597.8	52.4	1435.94	9086.1	1435.9	2885.2	77.31	SC
NAGAUUR	DEGANA	146334	146334	4251.6	84.5	71.0	293.5	4700.6	235.0	4465.6	7561.1	186.0	1632.00	9379.1	1632.0	0	210.03	OE
NAGAUUR	DIDWANA	97718	97718	2723.9	24.1	92.8	89.6	2930.4	293.0	2637.4	2274.3	0.3	1103.20	3377.8	1103.2	0	128.07	OE
NAGAUUR	JAYAL	167771	167771	3812.2	62.1	208.1	186.2	4268.5	426.9	3841.7	4965.8	336.0	1520.00	6821.8	1520.0	0	177.57	OE
NAGAUUR	KHEENV SAR	191741	191741	5029.6	154.0	98.8	461.9	5744.3	574.4	5169.8	12316.7	0.0	2030.40	14347.1	2030.4	0	277.52	OE
NAGAUUR	KUCHAMAN CITY	71031	71031	3363.4	58.3	137.7	174.9	3734.3	373.4	3360.9	4664.9	450.0	856.80	5971.7	856.8	0	177.68	OE
NAGAUUR	LADNU	153008	153008	5118.1	55.7	354.2	180.9	5708.9	570.9	5138.0	4731.3	0.0	934.98	5666.3	935.0	0	110.28	OE
NAGAUUR	MAKRANA	114008	114008	6259.7	42.3	114.6	147.6	6564.1	656.4	5907.7	3797.1	0.0	1644.00	5441.1	1644.0	466.56	92.10	C
NAGAUUR	MERTA	154192	154192	4835.5	172.3	0.0	517.0	5524.9	552.5	4972.4	13787.0	86.4	72.00	13945.4	72.0	0	280.46	OE
NAGAUUR	MOLASAR	66042	66042	2578.9	45.9	87.8	162.4	2874.9	287.5	2587.4	4165.0	0.0	993.60	5158.6	993.6	0	199.37	OE
NAGAUUR	MUNDWA	151537	151537	3545.8	146.3	102.6	447.9	4242.6	424.3	3818.3	11882.6	78.0	149.60	12110.2	149.6	0	317.16	OE
NAGAUUR	NAGAUUR	157778	157778	2706.1	30.5	37.3	91.6	2865.4	286.5	2578.9	2442.1	9.6	628.80	3080.5	628.8	0	119.45	OE

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NAGAU	NAWA	79682	79682	1951.4	52.1	92.8	156.3	2252.6	225.3	2027.4	4168.7	0.0	684.80	4853.5	684.8	0	239.40	OE
NAGAU	PARBATSAR	107170	107170	4563.9	52.2	126.2	126.1	4868.4	486.8	4381.6	3565.7	1.4	847.36	4414.4	847.4	0	100.75	OE
NAGAU	RIYAN BARI	113814	113814	6004.7	96.8	0.0	295.0	6396.5	639.7	5756.9	7836.3	0.0	506.88	8343.2	506.9	0	144.93	OE
PALI	BALI	144980	94375	3695.9	191.5	0.0	426.4	4313.8	431.4	3882.4	5992.6	0.2	435.67	6428.4	435.7	0	165.58	OE
PALI	DESURI	81540	56531	2358.1	132.5	0.0	542.7	3033.3	303.3	2730.0	4223.2	0.0	390.61	4613.8	390.6	0	169.01	OE
PALI	JAITARAN	137741	124610	6289.7	0.0	0.0	432.5	6722.1	672.2	6049.9	8648.5	11.0	1595.82	10255.3	1595.8	0	169.51	OE
PALI	KHARCHI (MARWAR JUNCTION)	140407	125288	2737.0	34.9	0.0	245.3	3017.2	301.7	2715.5	4166.1	4.6	499.39	4670.0	499.4	0	171.98	OE
PALI	PALI	138703	127991	992.8	32.7	0.0	98.1	1123.6	112.4	1011.2	714.8	1.1	56.90	772.8	56.9	238.37	76.43	SC
PALI	RAIPUR	109222	65625	2167.9	0.0	0.0	186.9	2354.8	235.5	2119.3	3620.4	0.7	142.52	3763.6	142.5	0.02	177.58	OE
PALI	RANI STATION	78204	73906	2528.3	0.0	0.0	223.7	2752.0	275.2	2476.8	3551.5	0.0	466.34	4017.8	466.3	0	162.22	OE
PALI	ROHAT	140775	137790	336.3	5.8	0.0	17.2	359.3	35.9	323.3	91.7	0.0	6.94	98.6	6.9	224.74	30.49	safe
PALI	SOJAT	168155	154535	3659.8	70.4	0.0	211.3	3941.6	394.2	3547.4	4472.8	0.0	345.82	4818.6	345.8	0	135.83	OE
PALI	SUMERPUR	95973	94488	2889.9	0.0	0.0	1643.0	4532.9	453.3	4079.6	6152.3	0.1	426.04	6578.4	426.0	1457.6	161.25	OE
PRATAPGARH	ARNOD	66307	56335	2747.6	1.0	0.0	938.4	3687.0	368.7	3318.3	4942.0	0.0	143.33	5085.3	143.3	0	153.25	OE
PRATAPGARH	CHHOTI SADRI	70304	54238	2219.3	0.7	0.0	759.8	2979.8	298.0	2681.8	4033.9	0.0	64.40	4098.3	64.4	0.52	152.82	OE
PRATAPGARH	DHARIAWAD	88294	45856	1246.8	5.6	0.0	659.9	1912.3	191.2	1721.0	1520.5	19.0	152.09	1691.6	152.1	30.41	98.29	C
PRATAPGARH	PEEPALKHOONT	84086	48350	1911.6	46.6	0.0	1403.1	3361.3	336.1	3025.1	1988.9	0.0	103.65	2092.5	103.7	932.61	69.17	safe
PRATAPGARH	PRATAPGARH	126989	90260	7525.2	116.2	0.0	3182.5	10823.9	1081.8	9742.1	13180.1	0.0	180.35	13360.4	180.4	10.64	137.14	OE
RAJSAMAND	AMET	52356	46519	996.6	15.5	3.1	152.2	1167.4	116.8	1050.7	1263.4	118.3	224.41	1606.1	224.4	0	152.86	OE
RAJSAMAND	BHIM	68739	33716	847.8	4.6	13.5	210.5	1076.4	107.6	968.7	1244.7	0.0	162.36	1407.0	162.4	0	145.24	OE
RAJSAMAND	DEOGARH	61701	39076	836.8	9.3	2.1	169.1	1017.3	101.7	915.6	862.9	0.5	226.16	1089.6	226.2	0	119.00	OE
RAJSAMAND	KHAMNOR	79168	67586	1854.8	45.4	0.0	623.6	2523.7	252.4	2271.3	1415.4	19.2	712.26	2146.8	712.3	162.9	94.52	C
RAJSAMAND	KUMBHALGARH	78835	53656	1706.7	14.3	0.0	189.6	1910.6	191.1	1719.6	1263.5	3.8	412.75	1680.0	412.8	39.55	97.70	C
RAJSAMAND	RAILMAGRA	60814	60018	1521.4	46.4	0.0	332.5	1900.2	190.0	1710.2	2016.8	123.4	292.26	2432.4	292.3	0	142.23	OE
RAJSAMAND	RAJSAMAND	61933	53438	767.4	83.9	0.0	1138.1	1989.4	199.0	1790.4	1990.7	126.5	386.61	2503.8	386.6	352.46	139.85	OE

Dynamic Ground Water Resources of Rajasthan 2023

District	Block	Total Area of Assessment Unit (Ha)	Recharge Worthy Area (Ha)	Recharge from Rainfall-Monsoon Season	Recharge from Other Sources-Monsoon Season	Recharge from Rainfall-Non-Monsoon Season	Recharge from Other Sources-Non-Monsoon Season	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Ground Water Extraction for Irrigation Use	Ground Water Extraction for Industrial Use	Ground Water Extraction for Domestic Use	Total Extraction	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction	Category
				(ham)													%	
SAWAI MADHOPUR	BAMANWAS	72110	65655	5769.3	23.4	0.0	2686.4	8479.0	847.9	7631.1	11655.2	0.0	874.08	12529.3	874.1	0	164.19	OE
SAWAI MADHOPUR	BONLI	100450	98338	5121.7	594.9	0.0	1544.2	7260.7	726.1	6534.7	8176.1	0.0	1610.38	9786.5	1610.4	0	149.76	OE
SAWAI MADHOPUR	CHAUTH KA BARWARA	43900	40666	2676.5	61.8	0.0	647.5	3385.7	338.6	3047.2	3329.9	0.0	649.58	3979.5	649.6	0	130.60	OE
SAWAI MADHOPUR	GANGAPUR	64550	49892	4194.1	763.1	0.0	1995.9	6953.1	695.3	6257.8	10061.0	0.0	2201.18	12262.2	2201.2	0	195.95	OE
SAWAI MADHOPUR	KHANDAR	145381	105075	7362.2	140.0	0.0	2032.7	9535.0	953.5	8581.5	10622.2	0.0	1471.68	12093.9	1471.7	0	140.93	OE
SAWAI MADHOPUR	SAWAI MADHOPUR	75674	73224	6604.3	538.2	0.0	1472.0	8614.5	861.5	7753.1	12514.4	0.2	1029.48	13544.1	1029.5	0	174.69	OE
SIKAR	DANTA RAMGARH	121051	114045	4781.6	280.8	174.8	399.6	5636.7	563.7	5073.0	10239.9	4.4	1514.38	11758.7	1514.4	0	231.79	OE
SIKAR	DHOND	91115	90400	4263.7	211.3	236.0	330.2	5041.3	504.1	4537.2	9250.8	111.5	1360.91	10723.2	1360.9	0	236.34	OE
SIKAR	FATEHPUR	129123	129123	5174.5	44.3	316.8	54.9	5590.5	559.0	5031.4	1430.1	0.0	2701.15	4131.3	2701.2	900.19	82.11	SC
SIKAR	KHANDELA	74346	69399	2634.9	214.3	128.5	200.1	3177.8	317.8	2860.0	4043.2	3.7	937.33	4984.2	937.3	0	174.27	OE
SIKAR	LACHHMANGARH	105162	105162	4101.0	133.0	223.2	227.0	4684.2	468.4	4215.8	6757.6	0.0	2253.20	9010.8	2253.2	0	213.74	OE
SIKAR	NEEM KA THANA	71823	58562	2428.2	183.9	95.8	206.2	2914.2	291.4	2622.7	5160.4	11.2	792.34	5964.0	792.3	0	227.40	OE
SIKAR	PATAN	47889	28956	964.4	55.8	38.1	60.1	1118.3	111.8	1006.5	1303.8	4.8	404.27	1712.9	404.3	0	170.19	OE
SIKAR	PIPRALI	80766	74383	3330.0	492.7	184.4	291.6	4298.6	429.9	3868.8	5325.8	3.8	1529.14	6858.8	1529.1	0	177.29	OE
SIKAR	SRIMADHOPUR	66810	65662	3844.8	178.8	137.6	276.6	4437.9	443.8	3994.1	7856.9	81.9	716.22	8655.1	716.2	0	216.69	OE
SIROHI	ABU ROAD	83817	33106	2397.7	30.9	0.0	520.1	2948.7	294.9	2653.8	2609.3	48.1	366.72	3024.1	366.7	0	113.95	OE
SIROHI	PINDWARA	115690	88290	5427.0	68.8	0.0	905.1	6400.9	640.1	5760.8	4460.2	273.2	309.76	5043.2	309.8	717.63	87.54	SC
SIROHI	REODAR	108676	98580	6291.0	26.8	0.0	1298.3	7616.2	761.6	6854.6	10798.3	0.0	381.44	11179.8	381.4	0	163.10	SC
SIROHI	SHEOGANJ	88742	77289	5183.3	24.7	0.0	395.9	5603.9	560.4	5043.5	5500.4	0.4	279.04	5779.9	279.0	0	114.60	OE
SIROHI	SIROHI	116675	110305	6309.3	21.3	0.0	877.1	7207.8	720.8	6487.0	5792.2	19.0	503.68	6314.9	503.7	172.12	97.35	C
TONK	DEOLI	124209	124209	5932.9	426.8	0.0	1508.1	7867.8	786.8	7081.0	4527.8	3.0	1459.35	5990.2	1459.4	1090.8	84.59	SC
TONK	MALPURA	146447	79278	2742.8	1207.4	0.0	1919.2	5869.3	582.3	5287.0	6287.2	3.0	1349.90	7640.1	1349.9	87.25	144.51	OE
TONK	NIWAI	106187	59453	2623.3	460.9	0.0	962.3	4046.4	403.8	3642.6	3345.2	23.0	1135.79	4504.0	1135.8	15.69	123.65	OE
TONK	TODARAISINGH	102702	91114	4155.2	267.1	0.0	1184.9	5607.2	340.8	5266.4	2592.3	1.0	1008.51	3601.9	1008.5	1749.6	68.39	safe
TONK	TONK	141423	137890	7399.2	1021.1	0.0	3084.5	11504.7	1150.5	10354.3	7753.1	6.0	2294.17	10053.3	2294.2	300.95	97.09	C

Dynamic Ground Water Resources of Rajasthan 2023

District	Block	Total Area of Assessment Unit (Ha)	Recharge Worthy Area (Ha)	Recharge from Rainfall-Monsoon Season	Recharge from Other Sources-Monsoon Season	Recharge from Rainfall-Non-Monsoon Season	Recharge from Other Sources-Non-Monsoon Season	Total Annual Ground Water Recharge	Total Natural Discharges	Annual Extractable Ground Water Resource	Ground Water Extraction for Irrigation Use	Ground Water Extraction for Industrial Use	Ground Water Extraction for Domestic Use	Total Extraction	Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction	Category
				(ham)													%	
TONK	UNIARA	99038	96230	6337.8	460.6	0.0	2535.3	9333.7	933.4	8400.3	5453.7	0.0	3581.21	9034.9	3581.2	0	107.55	OE
UDAIPUR	BARGAON	46644	26284	843.1	20.7	0.0	285.0	1148.7	114.9	1033.9	524.4	788.4	131.68	1444.5	131.7	21.38	139.72	OE
UDAIPUR	BHINDAR	108631	90615	2510.8	33.7	0.0	955.8	3500.3	350.0	3150.3	2584.3	94.7	339.97	3018.9	340.0	131.35	95.83	C
UDAIPUR	GIRWA_RURAL	83519	58200	1943.2	40.2	0.0	568.2	2551.6	255.2	2296.5	1585.5	458.2	176.32	2220.0	176.3	76.45	96.67	C
UDAIPUR	GOGUNDA	51400	34022	1190.1	8.3	0.0	341.3	1539.7	154.0	1385.8	1226.1	3.1	124.80	1353.9	124.8	31.85	97.70	C
UDAIPUR	JHADOL	72752	37443	854.4	22.5	0.0	332.8	1209.8	121.0	1088.8	828.2	0.2	201.85	1030.2	201.8	58.57	94.62	C
UDAIPUR	JHALARA	53503	38944	1284.3	1.7	0.0	785.3	2071.3	207.1	1864.2	1505.1	1.0	116.61	1622.7	116.6	241.45	87.05	SC
UDAIPUR	KHERWARA	66729	48568	971.4	7.3	0.0	267.8	1246.5	124.7	1121.8	833.6	18.8	283.69	1136.1	283.7	14.13	101.28	OE
UDAIPUR	KOTRA	176112	62780	1697.8	30.9	0.0	746.9	2475.5	247.6	2228.0	2119.5	4.2	183.28	2307.0	183.3	59.48	103.54	OE
UDAIPUR	KURAWAR	50361	36180	1001.3	20.8	0.0	688.1	1710.1	171.0	1539.1	962.2	387.1	151.56	1500.8	151.6	251.96	97.52	C
UDAIPUR	LASADIYA	49375	34814	886.1	0.0	0.0	280.8	1166.9	116.7	1050.2	1112.0	0.0	122.22	1234.2	122.2	0	117.52	OE
UDAIPUR	MAVLI	80858	78357	2384.6	6.9	0.0	942.2	3333.6	333.4	3000.3	3654.3	152.4	137.75	3944.5	137.8	0	131.47	OE
UDAIPUR	PHALASIYA	74222	38200	871.7	0.0	0.0	223.7	1095.5	109.5	985.9	847.4	0.0	132.08	979.5	132.1	6.46	99.34	C
UDAIPUR	RISHABHDEV	42128	30662	650.8	56.2	0.0	687.2	1394.2	139.4	1254.8	1185.4	10.5	135.97	1332.0	136.0	89.98	106.15	OE
UDAIPUR	SALUMBAR	48797	35519	1171.4	67.5	0.0	1118.1	2357.0	235.7	2121.3	1716.2	10.0	204.10	1930.3	204.1	353.67	91.00	C
UDAIPUR	SARADA	72759	55684	1251.6	68.6	0.0	1092.4	2412.6	241.3	2171.3	1745.5	34.7	218.42	1998.6	218.4	172.7	92.05	C
UDAIPUR	SAYRA	56356	37241	1092.8	0.0	0.0	274.1	1366.9	136.7	1230.2	1096.4	1.2	127.39	1225.0	127.4	5.19	99.58	C
UDAIPUR	SEMARI	35514	27179	651.5	2.3	0.0	333.0	986.9	98.7	888.2	693.1	0.0	139.88	833.0	139.9	66.83	93.78	C
UDAIPUR	UDAIPUR_URBAN	6400	6400	161.2	161.1	0.0	364.6	686.9	68.7	618.2	0.0	95.3	522.04	617.4	522.0	0.87	99.86	C



Meeting of the State Level Committee - Ground Water Resources Assessment 2022 of Rajasthan was held on 22.09.2023 at Secretariat, Jaipur under the chairmanship of Sh. Subodh Agarwal, IAS, Additional Chief Secretary, PHED and GWD, Govt. of Rajasthan for approval of the Dynamic Ground Water Resources of Rajasthan, as on 31-03-2023. SLC approved the GWRA Rajasthan as on 2023. Engineer M.S. Rathore Regional Director, CGWB, WR, Shri Suraj Bhan Singh, Chief Engineer, GWD, Rajasthan, Shri S.K. Pareek-D, CGWB, Jaipur and Smt. Preeti Pandey, Sc-C, CGWB, Jaipur attended the meeting. SLC approved the GWRA Rajasthan as on 2023

Dynamic Ground Water Resources of Rajasthan 2023



Workshop to give training for working on INGRES software - Ground Water Resources Assessment 2023 of Rajasthan held on 12.07.2023 at Conference Hall, CGWB, Jaipur, Chief Engineer, GWD, Regional Director, CGWB, Director Admin, CGWB, Officers from CGWB, GWD and experts from IIT-Hyderabad and Vassar labs attended the workshop.

Plate XIV

Dynamic Ground Water Resources of Rajasthan 2023