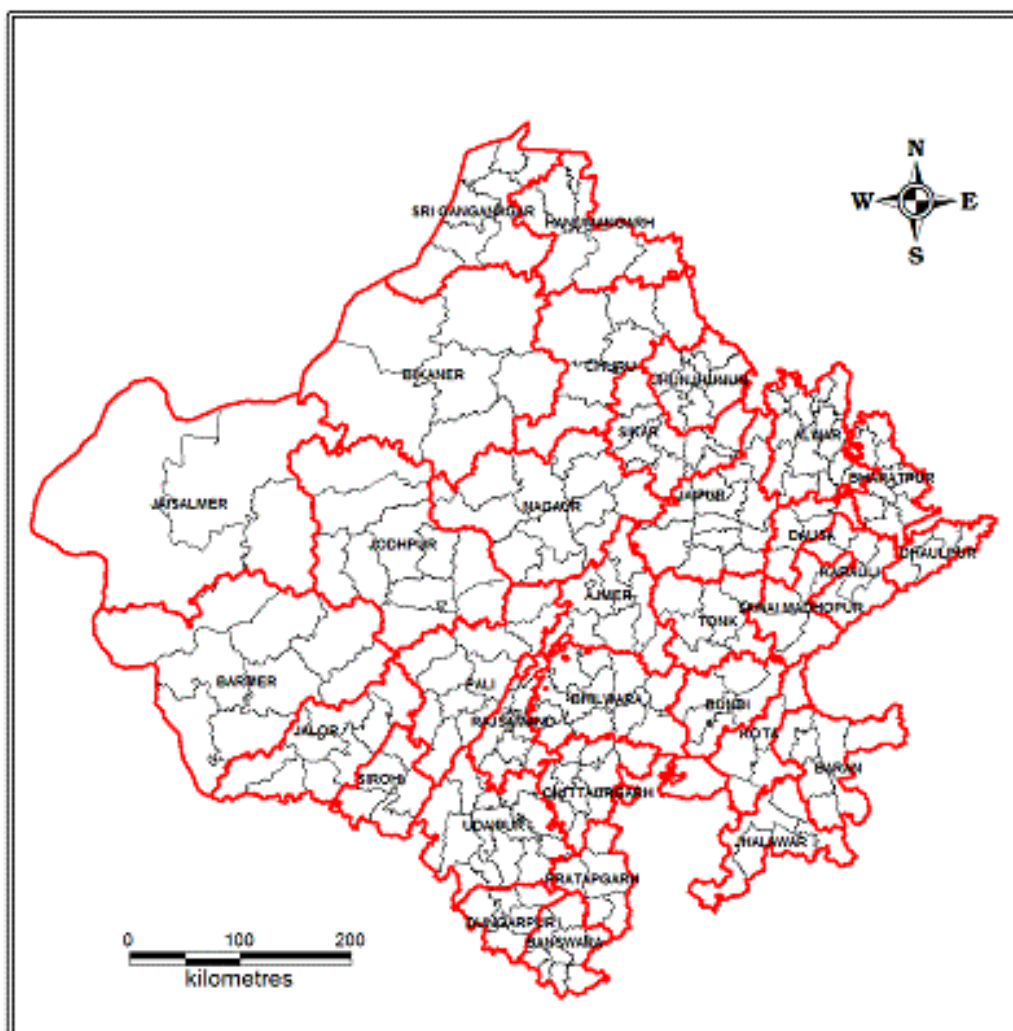
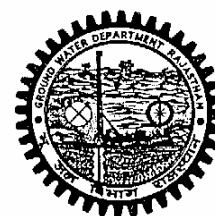




REPORT ON DYNAMIC GROUND WATER RESOURCES OF RAJASTHAN

(As on 31st March, 2013)



Prepared by

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Western Region, Jaipur**

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**Jaipur
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Executive Summary

Rajasthan is the largest state of country having an area of 3,42,326 Sq.Km. (10.4% of the country's geographical area). In Rajasthan, 91% of the Domestic Water requirements of Rural/Urban Sector are being catered from Groundwater Sources and only 9% Water requirement is being met from surface water sources. The source of surface water is limited to canal system of only few rivers mainly IGNP, Mahi, Chambal, Bisalpur Reservoir & recently constructed Narmada Canal. In spite of poor quality and meager quantity, the groundwater resources in the state are the only most reliable and dependable source for sustenance of life. Water demand is increasing at a faster rate due to increase in population, green revolution, rapid Industrial growth, urbanization and changing living standards. About 77% of the total irrigation water demand and most of the Industrial Water requirements are being catered from Groundwater resources only. Thus, meeting the various sectors' demands and safe water supply to human being are the challenging tasks for the planners in the State. The necessity, therefore, arises to estimate this dependable and precious resource periodically for meeting the various demands.

Administration of the state is controlled by seven divisions constituted by 33 districts, 215 tehsils, 248 blocks and 44672 villages. About three fourth (76.6%) population of state resides in rural area whereas less than a quarter (23.4%) lives in urban area. The female to male ratio of the state accounts to only 921/1000 which is lower than national average ratio. The population density of the state has lower value of 165 persons/Sq.Km. because the 2/3rd part of the state is covered by Thar Desert. The Decadal population growth is 21.4% at present, which is further increasing at a fast rate. Rajasthan has the largest livestock (18.7%) of the country. The net cultivable area of the state is 53.54% of the total area. In the western districts of Jaisalmer, Bikaner and Barmer, percentage of cultivable waste and fallow land is the highest on account of sandy soils in these areas. The gross irrigated area in the State is 8321825 ha (24.28%) whereas total forest cover is 2742705 ha (8%). The Canals irrigate approximately 19.57% of the gross irrigated area whereas remaining area is mostly irrigated through wells and tube wells.

The state is characterized by the most arid and drought prone state of the country because of low and scanty rainfall. The eastern part of Aravalli hill range covered by consolidated formations, receives higher rainfall whereas western area covered with Aeolian sand and alluvium receives scanty rainfall. The normal rainfall in the State is 549.1 mm and temperature varies from 0^o in winters to 48^o in summers, which has resulted in higher evapotranspiration rates. Due to excessive ground water draft, lowering of water table and quality deterioration of groundwater is the common problem in the State.

Physiography is the result of prolonged erosional and depositional processes. Land forms and drainage systems have been greatly influenced and determined by the geological formations and structures. About 58% area of the state is covered by sand dunes and desert. The highest elevation of state lies at Mount Abu (1722m amsl). Major part of western Rajasthan has inland drainage system whereas southern, south-eastern and the eastern parts have well developed drainage systems. Except Chambal River, other rivers are ephemeral and flow only during rainy season. The drainage in the alluvial areas is of dendritic nature. The Aravalli hill range is forming the main water divide in the State. Luni is the only major river in the west of Aravallis. Perennial rivers like Mahi and Chambal are important in southeastern and eastern part respectively. Sambhar, Didwana, Lunkaransar, Kuchaman, Pachpadra, Pokaran, Phalodi and Chhapar are **Saline lakes**.

Desert soil is quite common in the western, northern and northwestern parts whereas black cotton soil is limited to eastern and southeaster parts along Madhya Pradesh border. In other areas, alluvium is the most common soil. Rajasthan State is divided into 15 major River Basins. There are several irrigation projects that have been accomplished in the State and many are in progress. On completion of these projects, total irrigated area will increase to many folds.

Rajasthan displays a very significant part of the Indian shield with regard to both span of geological history and complexity of evolution. The region has well-preserved records of long and protected geological history varying from Archaean to Recent. Due to this, Rajasthan is also known as the Museum of Geology.

Central Ground Water Board in association with Ground Water Department, Govt. of Rajasthan is carrying out estimation of Groundwater Resources on periodic basis. Last assessment was carried on 31/03/2011 and the current estimation is as on 31/03/2013.

As per the current estimates, the State has Net Groundwater Availability of **11256.7695** MCM (11.256 BCM) whereas the gross groundwater draft is **15705.9976** MCM (15.706 BCM) with the Stage of groundwater development at **139.52%**.

The situation at block level reveals that out of total **248** blocks as on 31/03/2013, **164** blocks have become Over- Exploited, **09** are Critical, **28** are Semi-Critical and only **44** blocks fall under Safe category. Three blocks have **Saline groundwater**.

It is obvious that in Over-Exploited areas, the groundwater is mined from the Static reserves since the dynamic reserves are not getting replenished at a similar rate to its withdrawal. So the increasing number of Over-Exploited blocks has become the most challenging issue for the planners.

Dynamic Ground Water Resources of Rajasthan

As on 31st March 2013

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Dynamic Ground Water Resources of Rajasthan

As on 31st March 2013

1. Introduction

The Government of India vide D.O. No. 3/10/2011-GW dated 15/2/2012 from Joint Secretary, Ministry of Water Resources desired that in each State, a Group on re-estimation of Ground Water Resource & Irrigation Potential from Ground Water should be constituted for furnishing the relevant information to the Planning Commission. With this view, the said Committee with respect to Rajasthan state was constituted vide letter No. F.6(42)AR/Gr 3/2012 dated 29/06/2012 (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 Jaipur	Chairman
2. 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. General Manager, NABARD	Member
11. Regional Director, Central Ground Water Board, Western Region, Jaipur	Member-Secretary

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

1. To re-estimate the ground water and irrigation potential in Rajasthan in accordance with the methodology recommended by the Ground Water Estimation Committee 1997.
2. To re-estimate the status of utilization of the annual replenishable ground water resources
3. The types and numbers of ground water abstraction structures feasible in the State.
4. To lay down the norms for application of water for different crops grown in different seasons in various parts of the State and assess the total water requirement.
5. To assess the present and ultimate requirements of ground water for Domestic and Industrial use.
6. To recommend the programme for investigation and development of ground water resource (keeping in view the perspective laid by Government of India for harnessing the entire water resources by 2025 AD).

Ground Water Resource Estimation for the State is carried out periodically. The Ground Water Resources of Rajasthan were last estimated as on 31.03.2011. In the present report, block-wise dynamic ground water resources as on 31.3.2013 have been assessed. Ground Water Resources have been estimated as per the Ground Water Estimation Committee-1997 guidelines.

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

2. General Features of the State

2.1. Physiographic Features

2.1.1. Topography

The state has a fairly mature topography developed during the long period of denudation and erosion. The present physiography and land forms are greatly determined by the underlying geological formations & structures and the product of the fluvial cycle of erosion in the past, present & continuing desert cycle of erosion. Physiography and Drainage are shown in Plate II.

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 Scarpland and Deccan Lava Plateau

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 amsl. They are composed of Bhilwara, Aravalli and Delhi Super Group of rocks ranging in age from Archaean (2500 ma) to Proterozoic (740 ma). 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 and in Alwar district it is from south to north. In the remaining districts, forming the central and north eastern Rajasthan, trend 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 :

- i) 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 cover 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, scarpland 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 Vindhyan in Dholpur, Sawai Madhopur, Jhalawar and Kota districts along the Chambal River and its tributaries.

2.2. Drainage

The Aravalli Hill Ranges form the main water divide in Rajasthan. Luni is the only river west of Aravallis. 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 & 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, 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 rainfall in the State ranges from 158 mm to 895.3 mm as shown in Plate III. The state receives 90% of rainfall from southwest monsoon during June to September. The winter rainfall is meager. The average annual rainfall and departures from normal rainfall have been worked out in Figure-1 below:

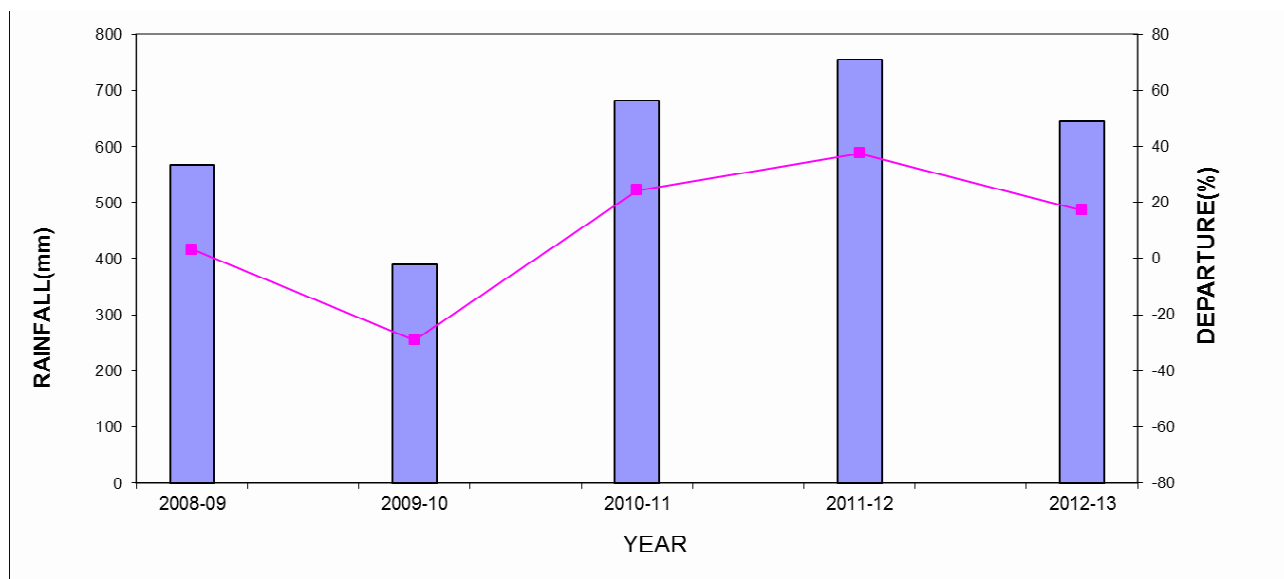


Figure 1: Average Annual Rainfall and Departure from Normal Rainfall

The average annual rainfall of the state during the period 2012-13 was 644.00 mm. The departure percentages of average annual rainfall from normal (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 years 2011-12 and 2012-13 was above normal with positive departures of 37.5% and 17.3%, respectively. However, average annual rainfall of the state during the year 2009-10 was below normal.

A perusal of Table1 reveals that 26 districts of the state have received more rainfall than normal annual rainfall during the year 2012-13. It is observed that Dungarpur and Ganganagar districts of Rajasthan have received good rainfall with positive departures of more than 50% from normal annual rainfall. There are 292 Rain gauge stations in the state. The annual rainfall data (June to May) of five years (2008-09 to 2012-13) has been analyzed to calculate average rainfall of each district in the respective years (Figure 1). Kota district has received poor rainfall with highest negative departure of 26.5%.

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 48⁰C.

January is the coldest month. The normal minimum temperature for the month of January ranges from 2⁰C in the north to 7.8⁰C in the south west in the western Rajasthan. At Mount Abu (1195 m amsl) temperature dips to freezing point during the months of December & January. In eastern Rajasthan, the normal minimum temperature (during January) in and around the Aravalli hills

ranges from 7°C to 8°C which increases towards east and attains a high of more than 10°C in the districts of Kota and Bundi.

Table 1: Average Annual Rainfall and Departure from Normal Rainfall

S. No.	District	Rainfall						Departure from Normal				
		Normal	Annual	Annual	Annual	Annual	Annual	(08-09)	(09-10)	(10-11)	(11-12)	(12-13)
		(1901-70)	(2008-09)	(2009-10)	(2010-11)	(2011-12)	(2012-13)	%	%	%	%	%
1	Ajmer	437	435.5	257.4	693.16	649.1	608.1	-0.3	-41.1	58.6	48.5	39.2
2	Alwar	626	854.3	524.7	783.59	607.9	706	36.5	-16.2	25.2	-2.9	12.8
3	Banswara	870	557.3	723.8	622.13	1095.5	1201	-35.6	-16.8	-28.5	25.9	38.0
4	Baran	895.3	949.5	701.6	612.19	1525.3	772.9	6.1	-21.6	-31.6	70.4	-13.7
5	Barmer	260	278.9	153.8	554.38	432.7	226.2	7.3	-40.8	113.2	67.2	-13.0
6	Bharatpur	675.1	771.3	573.8	820.7	750.9	735.9	14.2	-15	21.6	11.2	9.0
7	Bhilwara	603.3	564.5	375.4	709.75	752.3	592.9	-6.4	-37.8	17.6	24.7	-1.7
8	Bikaner	249.8	294.1	173.6	433.5	354.2	361.3	17.7	-30.5	73.5	41.8	44.6
9	Bundi	715.8	626.9	428.2	649.37	861.9	569.1	-12.4	-40.2	-9.3	20.4	-20.5
10	Chittorgarh	772.3	797.2	640.7	794.21	883.3	808.4	3.2	-17	2.8	14.4	4.7
11	Churu	337.9	466.8	216.5	688.67	652	451.8	38.1	-35.9	103.8	93.0	33.7
12	Dausa	625.7	808.4	433	757.6	796.8	928.6	29.2	-30.8	21.1	27.3	48.4
13	Dhaulpur	717.5	1007.8	489.6	738.83	648.6	878.4	40.5	-31.8	3	-9.4	22.8
14	Dungarpur	610.4	460.3	721.4	599.25	968	981.2	-24.6	18.2	-1.8	58.6	60.7
15	Ganganagar	171.6	287.2	212.3	370.44	334.1	283.7	67.4	23.7	115.9	94.7	65.3
16	Hanumangarh	237.5	339.4	199.6	438.29	388	328.2	42.9	-16	84.5	63.4	38.2
17	Jaipur	526.8	625.6	314.1	826.45	640.3	642.2	18.8	-40.4	56.9	21.5	21.9
18	Jaisalmer	158.6	206.3	99	396.67	308.3	235.3	30.1	-37.6	150.1	94.4	48.4
19	Jalore	400.6	353.5	167	834.97	681.3	358.8	-11.8	-58.3	108.4	70.1	-10.4
20	Jhalawar	884.8	685.6	657.4	625.78	1240.1	799.1	-22.5	-25.7	-29.3	40.2	-9.7
21	Jhunjhunu	459.5	543.7	262.6	831.57	632	552.7	18.3	-42.9	81	37.5	20.3
22	Jodhpur	296.7	329	143.1	481.29	406.8	364.8	10.9	-51.8	62.2	37.1	23.0
23	Karauli	616.2	986.3	535.2	768.92	680.3	828.8	60.1	-13.1	24.8	10.4	34.5
24	Kota	808.7	780.4	578.3	595.65	1263.2	594.4	-3.5	-28.5	-26.3	56.2	-26.5
25	Nagaur	363.1	427.8	161.9	554.34	449.6	541.3	17.8	-55.4	52.7	23.8	49.1
26	Pali	484.5	348	260	652.78	648.8	571.3	-28.2	-46.3	34.7	33.9	17.9
27	Rajsamand	556.1	393.8	408.4	842.29	772.6	634.3	-29.2	-26.6	51.5	38.9	14.1
28	Sawai Madhopur	655.8	740.9	478.6	666.29	838.4	706.1	13	-27	1.6	27.8	7.7

S. No.	District	Rainfall						Departure from Normal				
		Normal	Annual	Annual	Annual	Annual	Annual	(08-09)	(09-10)	(10-11)	(11-12)	(12-13)
		(1901-70)	(2008-09)	(2009-10)	(2010-11)	(2011-12)	(2012-13)	%	%	%	%	%
29	Sikar	459.8	508.1	226.6	868.71	602.2	689.1	10.5	-50.7	88.9	31.0	49.9
30	Sirohi	606.3	498.4	437.6	942.15	1079.5	752.7	-17.8	-27.8	55.4	78.0	24.1
31	Tonk	598.2	599.2	308.3	790.74	874.4	740.9	0.2	-48.5	32.2	46.2	23.9
32	Udaipur	632.7	622.4	593	895.89	836.3	727.8	-1.6	-6.3	41.6	32.2	15.0
33	Pratapgarh	806.0				1265.2	1079				56.97	33.9
RAJASTHAN		549.1	567.1	389.3	682.5	755.1	644.0	3.3	-29.1	24.3	37.5	17.3

2.4. Geology

The 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 wind blown sands. A generalised stratigraphic succession of various formations and rock types is given in Table-2.

2.4.1. Archaeans

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

2.4.2. Proterozoics

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

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

Vindhyan Super Group: Vindhyan unconformably overlie Delhi Super group rocks and have been deposited in two separate basins on either side of the Aravallis. In the eastern part, these are comprised of unmetamorphosed & relatively undisturbed sandstones, limestones and shales. Great Boundary Fault separates Vindhyan from Aravallis and Archeans.

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

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 comprised of sandstones and boulders.

2.4.4. Mesozoics

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

Table 2: Geological Succession

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 PROTERO-ZOIC		Vindhyan	Bhander/ Rewa/ Kaimur/ Semri	Sandstone, shale, limestone, conglomerate & basic flows
		Acid,Basic and Ultrabasic Intrusives and Extrusives MalaniVolcanics / Plutonics KishangarhSyenite		
LOWER PROTERO-ZOIC		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

2.4.5. 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-Aravallis, 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 of Tertiary age 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.

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 that returns to ground water contribute to storage. To study about ground water occurrence & its movement, 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 IV 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 mbgl 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 limestones form the main aquifers in Jaisalmer, Jodhpur, Barmer and Bikaner districts. Sandstones of Lathi formation are the most potential aquifers in Jaisalmer, Jodhpur and Barmer districts.

2.5.2. Fissured Formations

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

(a) Consolidated sedimentary rocks comprised of 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.

(b) Igneous and metamorphic rocks of lower Proterozoic age comprised of slate, quartzite, phyllite, schist, gneiss and various crystallines of Bhilwara Supergroup. These are mostly found in Banswara, Dungarpur, Udaipur, Chittorgarh, Bhilwara, Tonk, Jaipur, Alwar, Jhunjhunu, Nagaur, Churu, Barmer, Jaisalmer, Pali, Jalore, Sirohi and Jodhpur districts.

(c) 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.

(d) 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. The depth to water level map of pre-monsoon (May 2012) has been depicted in Plate V.

In the east of Aravallis, 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 in the eastern side of Aravallis, whereas it slopes towards west and north-west in its western side. 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.

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 Sear, 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, tertiaries of Bikaner, Nagaur, Churu, Barmer and Jaisalmer districts and localized pockets of Quaternary age. High fluoride hazard is found in almost all the districts with varying intensity. The problems of high nitrate and other constituents beyond permissible limits of drinking and irrigation also exist in some arid districts. The 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 was done on the basis of recommendations of Ground Water Estimation Committee—1984 (GEC'84). The GEC'84 methodology was subsequently modified in the light of enhanced database and new findings of experimental studies in the field of hydrogeology. The present methodology used for resource assessment is known as Ground Water Resource Estimation Methodology—1997 (GEC'97). In GEC'97, two approaches have been recommended. The water level fluctuation method is based on the concept of storage change due to difference between various input and output components. Input refers to recharge from rainfall and other sources and subsurface inflow into the assessment unit. Output 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.

In hard rocks, Ground water resources assessment unit in general is watershed. In case of alluvial areas, administrative block can also be the 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 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-

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

Where,

h = rise in water level in the monsoon season

A = area for computation of recharge

Sy = specific yield

D_G = gross ground water draft

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 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 Net Ground Water Availability.

Net Ground Water Availability	=	Annual Ground Water Recharge	-	Natural Discharge during non- monsoon season

Norms for Estimation of Recharge

GEC'97 methodology has recommended norms for various parameters being used in ground water recharge estimation. These norms vary depending upon water bearing formations and agro climatic conditions. While norms for specific yield and recharge from rainfall values are to be adopted within the guidelines of GEC'97, in case of other parameters like seepage from canals, return flow from irrigation, recharge from tanks and ponds, water conservation structures, results of specific case studies may replace the ad-hoc norms.

3.2. Ground Water Draft

The gross yearly ground water draft is to be calculated for Irrigation, Domestic and Industrial uses. The gross ground water draft 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 97.

3.3. Stage of Ground Water Development & Categorization of Units

The Stage of Ground Water Development is defined by:

$$\text{Stage of Ground Water Development (\%)} = \frac{\text{Existing Gross Ground Water Draft for All uses}}{\text{Net Annual Ground Water Availability}} \times 100$$

Categorization of Areas for Ground Water Development

The units of assessment are categorized for ground water development based on two criteria –a) Stage of Ground Water Development, and b) Long Term Trend of pre and post monsoon water

levels. Four categories are -- **Safe** areas, which have ground water potential for development; **Semi-Critical** areas where cautious ground water development is recommended; **Critical** areas and **Over-Exploited** areas where there should be intensive monitoring and evaluation and future ground water development be linked with water conservation measures. The criteria for categorization of assessment units have been given in Table 3.

Table-3: Criteria For Categorization Of Assessment Units

S.No.	Stage of Ground Water Development	Significant Long Term Decline		Categorization
		Pre-monsoon	Post-monsoon	
1	$\leq 70\%$	No	No	SAFE
		Yes/No	No/Yes	To be reassessed
		Yes	Yes	To be reassessed
2	$>70\%$ and $\leq 90\%$	No	No	SAFE
		Yes/No	No/Yes	SEMI-CRITICAL
		Yes	Yes	To be reassessed
3	$>90\%$ and $\leq 100\%$	No	No	To be reassessed
		Yes/No	No/Yes	SEMI-CRITICAL
		Yes	Yes	CRITICAL
4	$> 100\%$	No	No	To be reassessed
		Yes/No	No/Yes	OVER-EXPLOITED
		Yes	Yes	OVER-EXPLOITED

Note:

1. To be re-assessed' means that data is to be checked for the purpose of categorization.
2. The long-term ground water level data should preferably be for the period of 10 years.
3. The significant rate of water level decline may be taken between 10 and 20cm per year depending upon the local hydrogeological conditions.

3.4. Future allocation of Ground Water Resources

Future allocation of ground water resources for utilization is to be computed as given below:

Case I, when $GW_{av} \geq D_{gi} + Alld$

In such cases Allocation for future domestic requirement = $Alld$

Case II, when $GW_{av} < D_{gi} + Alld$

In such cases Allocation for future domestic requirement = $(GW_{av} - D_{gi})$ or D_{gd} , whichever is more.

Where,

GW_{av} = Net Annual Ground Water Availability

D_{gi} = Existing Ground Water draft for Irrigation

D_{gd} = Existing Ground Water draft for Domestic use

D_g = Existing Ground water draft for all uses

$Alld$ = Computed value of allocation for domestic use

(Based on projected population, fractional load and per capita requirement)

The results of ground water resource assessment shall be reconciled with the findings of the preliminary assessment (point 3, above) before *finalizing the Categorization of the assessment units*.

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.

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—

Potential Ground Water Recharge = (5-D) X A X 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 for computation of Ground Water Resources

The various norms adopted for computation of ground water resources have been given in Table 4.

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.

ii) Rainfall Infiltration Factor (RIF)

RIF for alluvial areas has been taken from 0.06 to 0.18 depending on rainfall distribution. For Semi-consolidated Lathi basin area, values ranging from 0.03 to 0.07% while for Tertiary formation, values ranging from 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 unlined 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.

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.

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 various groundwater abstraction structures like 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 4. Norms Adopted for computation of Ground Water Resources

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	0.025	-	-	-	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/Sl	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

	Seepage Factor
Seepage from Tanks & Ponds	
Hard Rock Formation	2% to 9% of Live Storage
Alluvium Formations	15% or 1.20 to 1.40 mm/day of water spread area
Seepage from Canals	
Lined canals	1.5 to 15 ham of wetted area
Unlined canals	3 to 15 ham of wetted area
Return Flow from Surface Water Irrigation	10% to 30% of water applied
Return Flow from Ground Water Irrigation	5% to 25% of water applied
Natural Discharge	
Water level fluctuation value accepted.	5% of gross recharge
Rainfall infiltration factor value accepted.	10% of gross recharge

4.2. Ground Water Resources Assessment:

Ground Water Assessment in the State of Rajasthan has been carried out in association with Ground Water Department, Rajasthan as on 31st March 2013 based on guidelines of Ground Water Estimation Committee (GEC), 1997. In this, Block (Panchayat Samiti) has been considered as the assessment unit. The blocks have been further divided into formation potential zones. There are a total of **248** blocks and **899** formation potential zones in **33** districts of the State. The Block wise/Assessment unit wise ground water resources, Ground Water Draft, Stage of Development and the category of the units is given in Annexure II and the district wise summary is given in Table 5.

Water level trends for the last **10-15** years (1996-2012) and water level fluctuations for the last 5 years (2008-2012) were considered for groundwater recharge estimation while groundwater draft as on **March 2013** was assessed. Groundwater requirement for domestic & industrial purposes were projected for the year **2025 AD**.

As per the estimates, Rajasthan has Net Ground Water availability of the tune of **11256.7695 MCM (11.2567695 BCM)**. Block wise range of net ground water availability is depicted in Plate VI. The existing gross ground water draft for all purposes is of the magnitude of **15705.9976 MCM (15.7059976 BCM)**. Block wise range of Ground Water Draft is depicted in Plate VII. The overall stage of groundwater development in the State is **139.52%**.

The allocation of water for domestic & industrial purposes is **2315.1773 MCM (2.3151773 BCM)** & that for irrigation requirement is **903.1139 MCM (0.9031139 BCM)**.

The assessment units (Blocks) have been categorized on the basis of the stage of ground water development and long-term trend of ground water levels. The major part of the State falls in Over Exploited category. Out of the total **33** districts, **24** are Over Exploited, **5** Critical, **2** Semi Critical and **2** are Safe (Table 6).

At block level also, majority of the blocks fall in Over Exploited category. Out of **248** blocks for which computations have been done, **164** fall in Over Exploited Category, **09** in Critical, **28** in Semi Critical and **44** in Safe Category. Three block viz Taranagar of Churu, Khajuwala of Bikaner and Rawatsar of Hanumangarh districts have not been assessed due to saline groundwater.

S. No.	Category	No. of Blocks	S. No.	Category	No. of Blocks
1	Safe	44	3	Critical	09
2	Semi-critical	28	4	Over Exploited	164
				Total	248*
	*Saline	3			

The stage of groundwater development and category of all blocks have been given in Table 7 and depicted in Plate VIII & Plate IX, respectively.

4.3. Areas having Ground Water Development Prospects

Estimates reveal the fact that the scope of future groundwater resource development in the state is very less. As per present groundwater resource estimates, out of total **248** blocks in the state, **164** blocks are categorized as **Over-exploited**, **09** blocks as **Critical**, **28** blocks as **Semi Critical**. Remaining **44** blocks, which have been categorized as **Safe**, have constraints for groundwater development due to deep water levels, its poor quality or falling in canal command area. Taranagar Block of Churu, Rawatsar Block of Hanumangarh and Khajuwala Block of Bikaner districts have not been assessed due to poor quality in the entire blocks.

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.

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

Since large number of blocks fall under over exploited category, there is an urgent need for enforcement of groundwater regulation, control and management strategies in these areas. Actions to impose and implement restrictions on installation of new wells in Notified areas need to be initiated. The feasible schemes on rainwater harvesting and artificial recharge structures in Over-exploited areas should be implemented as early as possible.

4.4. Spatial Variation of Groundwater Resources

Rajasthan State witnesses 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 rainfall & high evaporation) and ground water development is also relatively less due to constraints of deep groundwater levels, inferior quality of water and availability of canal water in parts. Due to availability of canal water & high rainfall in Banswara, all the 8 No. of blocks fall under Safe category. Further, due to poor quality of groundwater and availability of canal water, Ganganagar and Hanumangarh districts over all have been categorized under Safe category, Churu district under Semi-critical and Bikaner & Jaisalmer districts under Critical category. The 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

The comparison of groundwater estimates as on **31.03.2011** and **31.03.2013** (estimated as per GEC 1997 methodology) has been given below to know about the changes in groundwater resources.

Particulars	2011	2013
Net Annual Ground Water Availability	10828.97 MCM	11256.77 MCM
Gross Ground Water Draft	14842.99 MCM	15706 MCM
Stage of GW Development	137.07%	139.52%
Category of Blocks		
Safe	26	44
Semi-Critical	19	28
Critical	24	09
Over-Exploited	172	164
Saline	2	3
Total of Blocks	243	248

The quantity of Net Annual Groundwater availability was **10828.97** MCM in 2011 which has increased to **11256.77** MCM in 2013 due to comparatively good rainfall during the years 2011 to 2013. There is significant increase in Gross Groundwater Draft during these two years from **14842.99** MCM in 2011 to **15706** MCM in 2013 which has resulted in increase of stage of groundwater development from **137.07 % to 139.52% in** these 2 years (Table 8).

4.6. Groundwater Resources in Poor Ground Water Quality Zone

Rajasthan being arid and the largest State of India has significant volume of saline groundwater especially in its western parts in **122** potential zones covering about **97673.13 Sq.Km.** area falling in **16** districts of state. The total poor quality groundwater available in the State has been assessed as **3053.38** MCM while the gross draft is **592.75** MCM. The allocation of **28.85 MCM** water has been done for Domestic & Industrial requirement and **2487.44** MCM for future irrigation development. District wise details of ground water resources in saline (Poor Quality) zones are given in Table 9. The blockwise details area given in Annexure II.

4.7. Additional annual potential recharge

No additional potential recharge under specific conditions of water logging / Shallow water table area in any district of Rajasthan has been noticed.

Table 5. Districtwise Ground Water Resources of Rajasthan as on 31.03.2013

S. No.	District	Area of District	Potential Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development	Category of District
		(Sq.km.)	(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)	
1	Ajmer	8481	7466.76	353.737	33.0753	320.6617	424.0035	47.4012	471.4047	47.8069	0	147.01	Over Exploited
2	Alwar	8720.46	6825.21	939.392	84.3534	855.0386	1362.0542	126.646	1488.7002	120.8226	0.5035	174.11	Over Exploited
3	Banswara	4536.08	3979.96	278.3289	41.7492	236.5797	95.3799	19.3288	114.7087	24.2415	116.9583	48.49	Safe
4	Baran	6955.31	6892.21	561.7178	56.172	505.5458	554.9389	51.1236	606.0625	89.8358	54.7007	119.88	Over Exploited
5	Barmer	28387	12734.65	278.0121	25.9776	252.0345	243.5104	68.636	312.1464	65.2973	21.6073	123.85	Over Exploited
6	Bharatpur	5044.1	3412.52	506.0657	49.0606	457.0051	474.2931	68.5481	542.8412	78.38	8.8095	118.78	Over Exploited
7	Bhilwara	10455	9354.85	476.2547	45.9518	430.3029	559.3632	43.3508	602.714	28.9695	0.0364	140.07	Over Exploited
8	Bikaner	26580.78	13602.51	254.8432	12.7421	242.1011	269.3298	89.487	358.8168	87.7435	45.0877	148.21	Over Exploited
9	Bundi	5500	4240.18	404.4048	55.078	349.3268	304.6889	27.2994	331.9883	37.901	49.3932	95.04	Critical
10	Chittaurgarh	7880	6095	380.7268	36.8747	343.8521	449.2251	14.9753	464.2004	50.3595	0	135	Over Exploited
11	Churu	11982.55	5191.74	141.822	7.0911	134.7309	99.4578	25.29	124.7478	57.7965	30.4677	92.59	Critical
12	Dausa	3420.17	3085.62	282.4243	28.0883	254.336	390.2294	25.5422	415.7716	29.0612	0	163.47	Over Exploited
13	Dhaulpur	3009.05	2486.14	299.5056	24.1852	275.3204	309.5217	29.1452	338.6669	35.7771	17.5159	123.01	Over Exploited
14	Dungarpur	3770	2634.13	146.7732	13.4453	133.3276	86.757	9.0429	95.7999	35.7529	16.3716	71.85	Semi-Critical
15	Ganganagar	11603.65	1545.64	404.1259	40.4127	363.7132	157.269	5.943	163.212	14.8575	195.1259	44.87	Safe
16	Hanumangarh	7907.35	1278.5	182.594	18.2595	164.3345	133.5591	7.490	141.0491	11.2351	19.5405	85.83	Semi-Critical
17	Jaipur	11061.44	9994.67	720.9992	70.2111	650.7881	1178.9164	315.9629	1494.8793	379.0413	5.0288	229.7	Over Exploited
18	Jaisalmer	38401	12090.04	70.1659	6.546	63.6199	125.5856	32.7323	158.3179	25.6101	23.9345	248.85	Over Exploited
19	Jalor	10639.78	8228.1	466.8073	40.3601	426.4472	789.6216	41.9676	831.5892	42.8838	11.5076	195	Over Exploited
20	Jhalawar	6252.8	6106.16	664.7804	117.9737	546.8067	521.8192	17.5709	539.3901	26.4315	33.2869	98.64	Critical
21	Jhunjhunun	5928	5273.69	275.598	24.8355	250.7625	462.6845	104.0513	566.7358	92.8982	3.2265	226	Over Exploited
22	Jodhpur	22250	18867.92	438.9007	43.3778	395.5229	779.2993	128.2890	907.5883	131.927	51.0917	229.47	Over Exploited

S. No.	District	Area of District	Potential Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development	Category of District
23	Karauli	5038.6	3902.42	358.7049	34.6212	324.0837	421.8698	52.1752	474.045	53.3746	8.5782	146.27	Over Exploited
24	Kota	5203.94	5123.17	576.7188	54.4621	522.2567	496.7366	50.2015	546.9381	90.9944	67.0606	104.73	Over Exploited
25	Nagaur	17718.25	16378.5	575.2038	56.0486	519.1552	823.3625	192.9325	1016.295	195.8862	41.3778	195.76	Over Exploited
26	Pali	12357	7362.54	326.6325	32.0141	294.6184	314.9091	33.937	348.8461	35.5027	13.9272	118.41	Over Exploited
27	Pratapgarh	4359.8	2950.39	171.3859	15.8536	155.5323	173.8576	6.0868	179.9444	28.2425	8.5168	115.7	Over Exploited
28	Rajsamand	4635.46	3540.09	124.3024	12.4305	111.8719	103.1048	15.4763	118.5811	36.416	0.6961	106	Over Exploited
29	Sawai Madhopur	5020.65	4325.63	412.3813	33.5284	378.8529	387.6421	81.7826	469.4247	81.8255	3.5875	123.91	Over Exploited
30	Sikar	7880.85	7263.46	328.6227	31.5851	297.0376	380.4024	69.1323	449.5347	93.3285	8.5604	151.34	Over Exploited
31	Sirohi	5136	4075.7	303.671	28.4881	275.1829	306.5067	11.0848	317.5915	14.1188	11.6348	115.41	Over Exploited
32	Tonk	7200.06	6524.72	486.7087	44.297	442.4117	365.1928	75.5414	440.7342	92.4655	25.657	99.62	Critical
33	Udaipur	11760.6	7770.92	321.0255	37.4175	283.608	241.4333	31.2984	272.7317	78.3928	9.3233	96.17	Critical
	Total	335076.73	220603.74	12513.337	1256.5672	11256.7695	13786.5253	1919.4723	15705.9976	2315.1773	903.1139	139.52	Over Exploited

Table 6. Categories of Blocks as on 31.03.2013

District	Total Blocks	Safe	Semi Critical	Critical	Over Exploited	Saline
Ajmer	8				8	
Alwar	14				14	
Banswara	8	8				
Baran	7		3		4	
Barmer	8	1		1	6	
Bharatpur	9			2	7	
Bhilwara	11				11	
Bikaner	6	2			3	1
Bundi	5	2	1		2	
Chittaurgarh	12				11	
Churu	5	3			2	1
Dausa	5				5	
Dhaulpur	4		2		2	
Dungarpur	5	4	1			
Ganganagar	9	8				
Hanumangarh	6	6				1
Jaipur	13			1	12	
Jaisalmer	3				3	
Jalor	8			1	7	
Jhalawar	6	1	4		1	
Jhunjhunun	8				8	
Jodhpur	10	2			8	
Karauli	5	1			4	
Kota	5		2	1	2	
Nagaur	11			2	9	
Pali	10	1	2		7	
Pratapgarh	5	1		1	3	
Rajsamand	7		3		4	
Sawai	5				5	

District	Total Blocks	Safe	Semi Critical	Critical	Over Exploited	Saline
Madhopur						
Sikar	8		1		7	
Sirohi	5		2		3	
Tonk	6	3			3	
Udaipur	11	1	7		3	
Total	248	44	28	9	164	3

*** Taranagar block of Churu district, Khajuwala block of Bikaner district and Rawatsar block of Hanumagarh district have saline ground water.**

Table 7. List of Blocks Falling In Different Categories as on 31.03.2013

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
Ajmer	8							Arain	114.49		
								Bhinai	113.07		
								Jawaja	149.59		
								Kekri	172.60		
								Kishangarh (Silora)	134.43		
								Masuda	117.01		
								Peesangan	208.53		
								Srinagar	133.76		
Alwar	14							Bansur	162.22		
								Behror	293.81		
								Kathumar	215.81		
								Kishangarh Bas	163.21		
								Kotkasim	178.91		
								Laxmangarh	188.79		
								Mandawar	186.79		
								Neemrana	172.04		
								Rajgarh	173.08		
								Ramgarh	181.44		
								Reni	228.52		
								Thanagazi	102.04		
								Tijara	151.90		
								Umren	172.58		
Banswara	8	Anandpuri	66.40								
		Bagidora	61.30								
		Banswara (Talwara)	47.75								
		Chhoti Sarwan	36.15								
		Garhi	41.19								

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
		Ghatol	35.59								
		Kushalgarh	69.51								
		Sajjangarh	55.85								
Baran	7							Atru	148.61		
								Baran	167.17		
								Chhabra	129.81		
								Chhipabarod	168.01		
				Anta	88.59						
				Kishanganj	84.96						
				Shahbad	79.96						
Barmer	8					Chohtan	97.82				
								Baetu	226.95		
								Balotra	162.46		
								Dhorimanna	139.07		
								Sheo	183.17		
								Sindhari	101.09		
								Siwana	140.61		
		Barmer	51.04								
Bharatpur	9					Deeg	97.87				
						Nagar Pahari	97.82				
								Bayana	107.21		
								Kaman	101.21		
								Kumher	111.23		
								Nadbai	179.44		
								Rupbas	111.05		
								Sewar	137.87		
								Weir	144.77		
Bhilwara	11							Asind	158.55		
								Banera	111.08		
								Hurda	130.82		
								Jahazpur	158.06		

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
								Kotri	112.43		
								Mandal	139.97		
								Mandalgarh	132.01		
								Raipur	172.25		
								Sahara	149.81		
								Shahpura	138.71		
								Suwana	155.17		
Bikaner	6							Bikaner	191.40		
								Dungargarh	136.69		
								Nokha	195.57		
		Kolayat	81.69								
		Lunkaransar	50.49								
										Khajuwala (not assessed)*	
Bundi	5							Hindoli	115.34		
								Nainwa	115.80		
		Keshorai Patan	86.22								
		Talera	69.67								
				Bundi	90.41						
Chittaurgarh	11							Bari Sadri	149.68		
								Begun	149.43		
								Bhadesar	150.82		
								Bhainsrogarh	109.27		
								Bhopalsagar	111.10		
								Chittaurgarh	142.96		
								Dungla	113.07		
								Gangrar	124.79		
								Kapasan	155.06		
								Nimbahera	134.99		
								Rashmi	129.21		
Churu	6							Rajgarh	374.96		

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
								Sujangarh	131.73		
		Churu	87.97								
		Ratangarh	74.40								
		Sardarshahar	39.79								
										Taranagar (not assessed)*	
Dausa	5							Bandikui	219.37		
								Dausa	116.87		
								Lalsot	205.44		
								Mahwa	150.33		
								Sikrai	148.25		
Dhaulpur	4							Dholpur	178.58		
								Rajakhera	130.09		
				Bari	91.42						
				Baseri	95.10						
Dungarpur	5	Aspur	50.80								
		Bichhiwara	81.57								
		Dungarpur	85.22								
		Sagwara	74.90								
				Simalwara	76.46						
Ganganagar	8	Anupgarh	8.37								
		Ganganagar	62.04								
		Gharsana	23.28								
		Karanpur	62.31								
		Padampur	57.92								
		Raisinghnagar	43.53								
		Sadulshahar	34.61								
		Suratgarh	70.28								
Hanumangarh	7	Bhadra	76.97								
		Hanumangar	84.27								

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
		h									
		Nohar	88.57								
		Pilibanga	87.83								
		Sangaria	86.43								
		Tibi	87.89								
										Rawatsar (not assessed)*	
Jaipur	13					Phagi	94.00				
								Amer	260.73		
								Bassi	244.46		
								Chaksu	168.49		
								Dudu	116.90		
								Govindgarh	269.06		
								Jamwa Ramgarh	203.72		
								Jhotwara	410.55		
								Kotputli	236.49		
								Sambhar	383.00		
								Sanganer	245.76		
								Shahpura	261.86		
								Viratnagar (Bairath)	171.50		
Jaisalmer	3							Jaisalmer	332.71		
								Sam	125.33		
								Sankra	331.66		
Jalor	8					Chitalwana	95.49				
								Ahore	120.32		
								Bhinmal	227.85		
								Jalore	147.56		
								Jaswantpura	142.79		
								Raniwara	234.56		

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
								Sanchoe	200.54		
								Sayla	317.75		
Jhalawar	6							Khanpur	109.63		
		Dag	89.04								
				Bakani	98.20						
				Jhalrapatan	98.26						
				Manohar Thana	97.00						
				Pirawa	99.86						
Jhunjhunun	8							Alsisar	100.71		
								Buhana	181.56		
								Chirawa	284.41		
								Jhunjhunun	241.56		
								Khetri	183.97		
								Nawalgarh	293.87		
								Surajgarh	249.69		
								Udaipurwati	250.68		
Jodhpur	10							Balesar	277.03		
								Bawari	508.23		
								Bhopalgarh	225.64		
								Bilara	266.30		
								Mandor	159.70		
								Osian	382.96		
								Phalodi	212.15		
								Shergarh	196.60		
		Bap	61.16								
		Luni	59.96								
Karauli	5							Hindaun	220.42		
								Karauli	112.33		
								Sapotra	107.90		
								Todabhim	248.66		
		Nadoti	81.54								

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
Kota	5					Itawa	90.90				
								Khairabad	148.59		
								Sangod	177.25		
				Ladpura	82.39						
				Sultanpur	84.15						
Nagaur	11					Ladnu	99.85				
						Nagaur	96.83				
								Degana	179.54		
								Didwana	168.04		
								Jayal	103.93		
								Kuchaman city	283.83		
								Makrana	124.34		
								Merta	321.83		
								Mundwa	347.96		
								Parbatsar	193.14		
								Riyan	138.91		
Pali	10							Bali	101.06		
								Desuri	114.46		
								Jaitaran	128.78		
								Marwar Junction	155.79		
								Raipur	141.43		
								Rani	119.34		
								Sojat	121.71		
		Pali	70.19								
				Rohat	79.54						
				Sumerpur	97.90						
Pratapgarh	5					Dhariyabad	93.48				
								Arnod	135.50		
								Chhotisadri	142.44		

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
								Pratapgarh	122.93		
		Peepalkhoont	65.61								
Rajsamand	7							Amet	113.44		
								Bhim	119.13		
								Railmagra	120.98		
								Rajsamand	107.25		
				Deogarh	97.20						
				Khamnor	96.36						
				Kumbhalgarh	98.82						
Sawai Madhopur	5							Bamanwas	105.81		
								Bonli	107.59		
								Gangapur	175.13		
								Khandar	103.14		
								Sawai Madhopur	134.27		
Sikar	8							Danta Ramgarh	169.55		
								Dhod	162.06		
								Khandela	103.74		
								Lachhmangarh	136.07		
								Neem Ka Thana	185.49		
								Piprali	186.71		
								Sri Madhopur	206.77		
				Fatehpur	70.99						
Sirohi	5							Reodar	143.19		
								Sheoganj	121.36		
								Sirohi	104.22		

District	Total Blocks	Safe		Semi Critical		Critical		Over Exploited		Saline	
		Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*	Block	Stage*
				Abu Road	99.07						
				Pindwara	99.18						
Tonk	6							Malpura	146.99		
								Niwai	110.57		
								Uniara	103.96		
		Deoli	88.28								
		Todaraisingh	79.37								
		Tonk	85.66								
Udaipur	11							Badgaon	114.57		
								Bhindar	112.43		
								Mavli	132.90		
		Kotra	81.53								
				Girwa	95.04						
				Gogunda	96.04						
				Jhadol	96.72						
				Kherwara	92.69						
				Lasadiya	98.33						
				Salumbar	72.16						
				Sarada	82.70						

* Stage of Ground Water Development

Table 8. Comparison of Categories Of Blocks As Computed on 31.03.2011 and 31.03.2013

S. No.	DISTRICT	NO OF BLOCKS		SAFE		SEMI CRITICAL		CRITICAL		OVER EXPLOITED	
		31.03.11	31.3.13	31.03.11	31.3.13	31.03.11	31.3.13	31.03.11	31.3.13	31.03.11	31.3.13
1	AJMER	8	8	0	0	0	0	0	0	8	8
2	ALWAR	14	14	0	0	0	0	0	0	14	14
3	BANSWARA	8	8	7	8	1	0	0	0	0	0
4	BARAN	7	7	1	0	1	3	0	0	5	4
5	BARMER	8	8	1	1	0	0	2	1	5	6
6	BHARATPUR	9	9	0	0	0	0	4	2	5	7
7	BHILWARA	11	11	0	0	0	0	0	0	11	11
8	BIKANER	6	6	1	2	1	0	0	0	3	3
9	BUNDI	4	5	0	2	1	1	0	0	3	2
10	CHITTORGARH	11	11	0	0	0	0	0	0	11	11
11	CHURU*	6	6	2	3	1	0	0	0	2	2
12	DAUSA	5	5	0	0	0	0	0	0	5	5
13	DHOLPUR	4	4	0	0	0	2	1	0	3	2
14	DUNGARPUR	5	5	1	4	4	1	0	0	0	0
15	GANGANAGAR	8	8	8	8	0	0	0	0	0	0
16	HANUMANGARH	3	7	3	6	0	0	0	0	0	0
17	JAIPUR	13	13	0	0	1	0	0	1	12	12
18	JAISALMER	3	3	0	0	0	0	1	0	2	3
19	JALORE	8	8	0	0	0	0	0	1	8	7
20	JHALAWAR	6	6	0	1	0	4	1	0	5	1
21	JHUNJHUNU	8	8	0	0	0	0	0	0	8	8
22	JODHPUR	10	10	1	2	1	0	0	0	8	8
23	KARALI	5	5	0	1	0	0	2	0	3	4
24	KOTA	5	5	0	0	3	2	0	1	2	2
25	NAGPUR	11	11	0	0	0	0	2	2	9	9
26	PALI	10	10	0	1	1	2	2	0	7	7
27	PRATAPGARH	5	5	1	1	0	0	1	1	3	3
28	RAJSAMAND	7	7	0	0	0	3	0	0	7	4
29	SAWAIMADHOPUR	5	5	0	0	0	0	0	0	5	5
30	SIKAR	8	8	0	0	1	1	0	0	7	7
31	SIROHI	5	5	0	0	0	2	2	0	3	3

S. No.	DISTRICT	NO OF BLOCKS		SAFE		SEMI CRITICAL		CRITICAL		OVER EXPLOITED	
		31.03.11	31.3.13	31.03.11	31.3.13	31.03.11	31.3.13	31.03.11	31.3.13	31.03.11	31.3.13
32	TONK	6	6	0	3	2	0	1	0	3	3
33	UDAIPUR	11	11	0	1	1	7	5	0	5	3
	TOTAL	243	248	26	44	19	28	24	09	172	164

Taranagar of Churu, Khajuwala block of Bikaner and Rawatsar of Hanumangarh districts have saline ground water.

Table 9. Ground water resources in poor quality areas in Rajasthan as on 31-03-2013

S. No.	District	Saline Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development
		(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)
1	Alwar	376.40	47.84	4.78	43.06	23.24	1.11	24.35	0.00	19.82	56.55
2	Barmer	15441.09	256.71	23.18	233.53	13.00	8.73	21.73	3.82	216.71	9.31
3	Bharatpur	1339.00	179.41	15.64	163.77	114.48	6.98	121.46	0.00	61.73	74.17
4	Bikaner	16779.24	304.80	15.24	289.56	0.15	0.00	0.15	0.00	289.23	0.05
5	Churu	8601.21	187.05	9.35	177.69	0.00	0.00	0.00	0.00	177.69	0.00
6	Ganganagar	10058.00	1039.81	94.71	945.10	95.11	0.46	95.57	1.14	848.85	10.11
7	Hanumangarh	8301.10	715.73	69.38	646.36	186.26	2.13	188.39	3.19	456.90	29.15
8	Jaipur	340.06	26.11	2.61	23.50	23.96	0.00	23.96	0.00	0.00	101.96
9	Jaisalmer	26054.96	176.64	17.66	158.98	2.39	1.50	3.89	8.52	148.06	2.45
10	Jalor	2023.43	101.43	10.14	91.29	31.40	1.13	32.53	1.30	67.98	35.63
11	Jhunjhunun	119.78	4.94	0.49	4.44	1.18	0.47	1.65	0.00	3.26	37.21
12	Jodhpur	3321.80	99.62	9.90	89.72	12.60	0.83	13.42	1.81	75.31	14.96
13	Nagaur	1339.75	52.16	5.22	46.94	8.31	6.90	15.21	7.16	31.48	32.41
14	Pali	3188.85	136.76	13.41	123.35	38.44	1.96	40.40	1.92	84.34	32.75
15	Sikar	93.46	4.16	0.42	3.74	1.78	0.00	1.78	0.00	1.97	47.42
16	Tonk	295.00	13.73	1.37	12.35	8.25	0.00	8.25	0.00	4.10	66.81
	Total	97673.13	3346.89	293.51	3053.38	560.55	32.20	592.75	28.85	2487.44	19.41

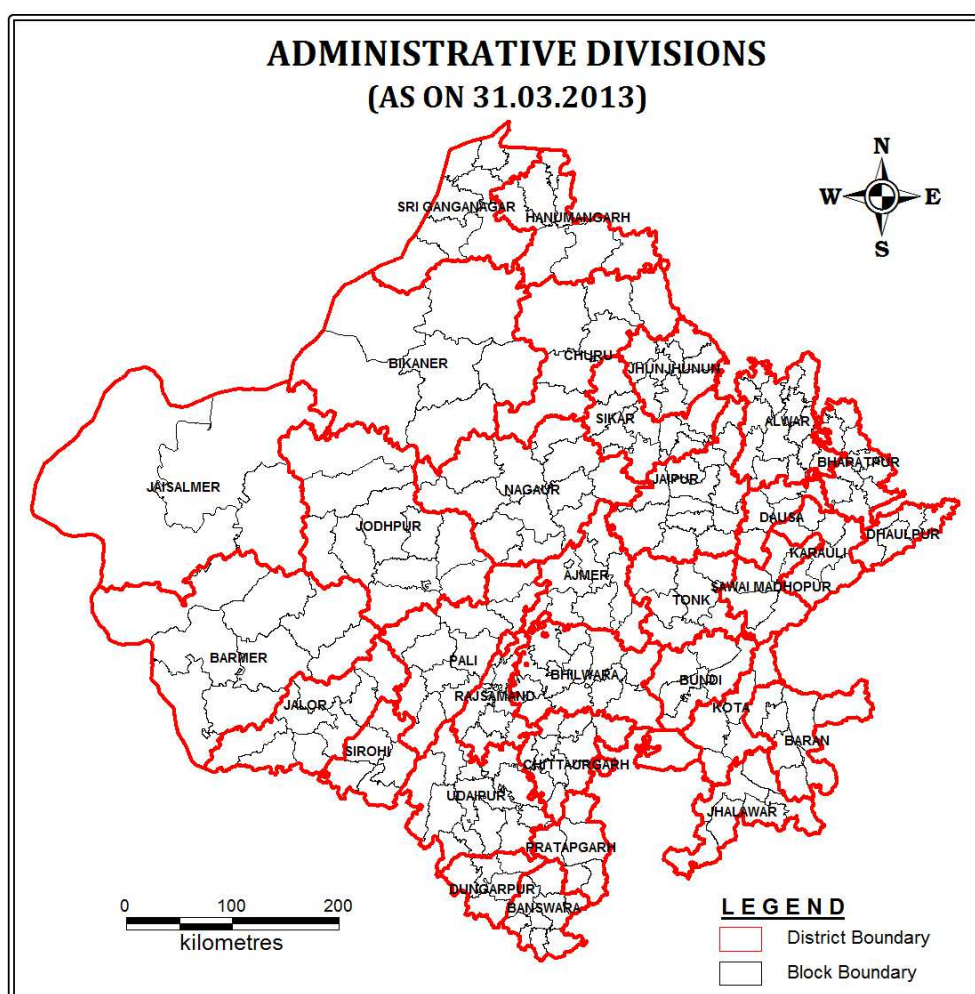


Plate I: Administrative Divisions Showing Assessment Units

Rajasthan

Physiography & Drainage

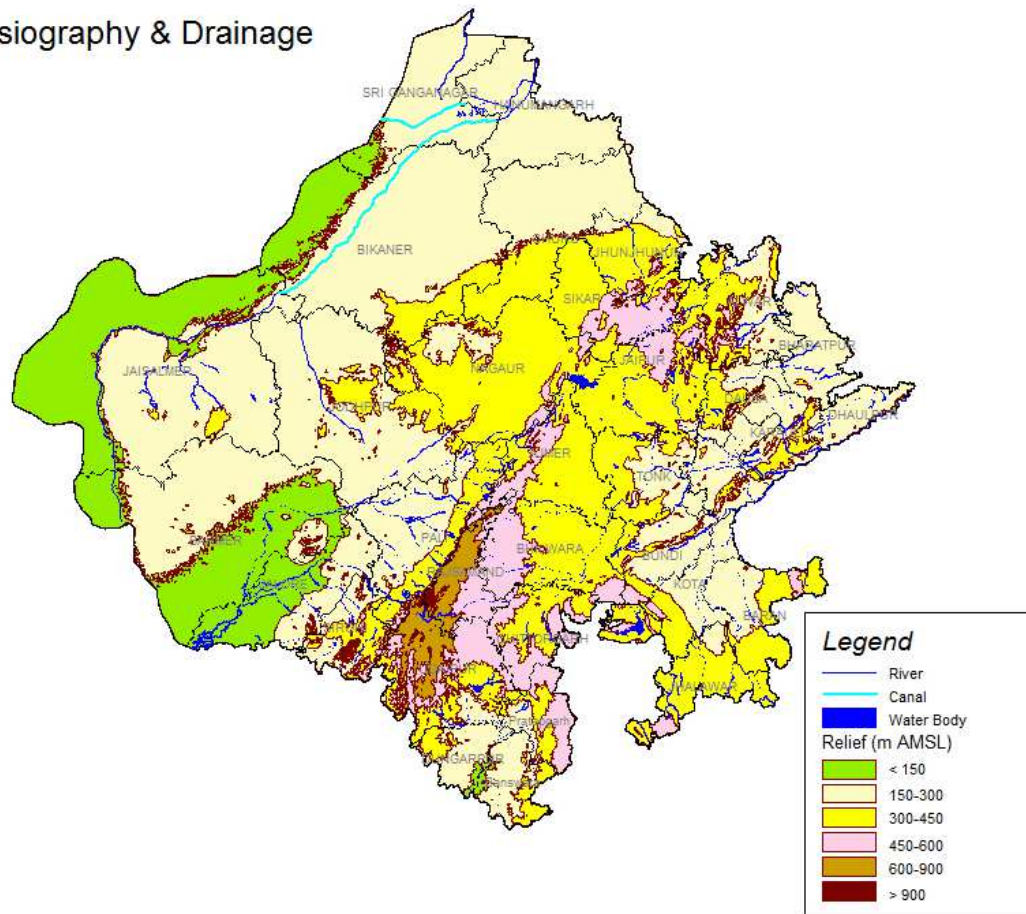


Plate II: Physiography and Drainage

Normal Annual Rainfall (mm)

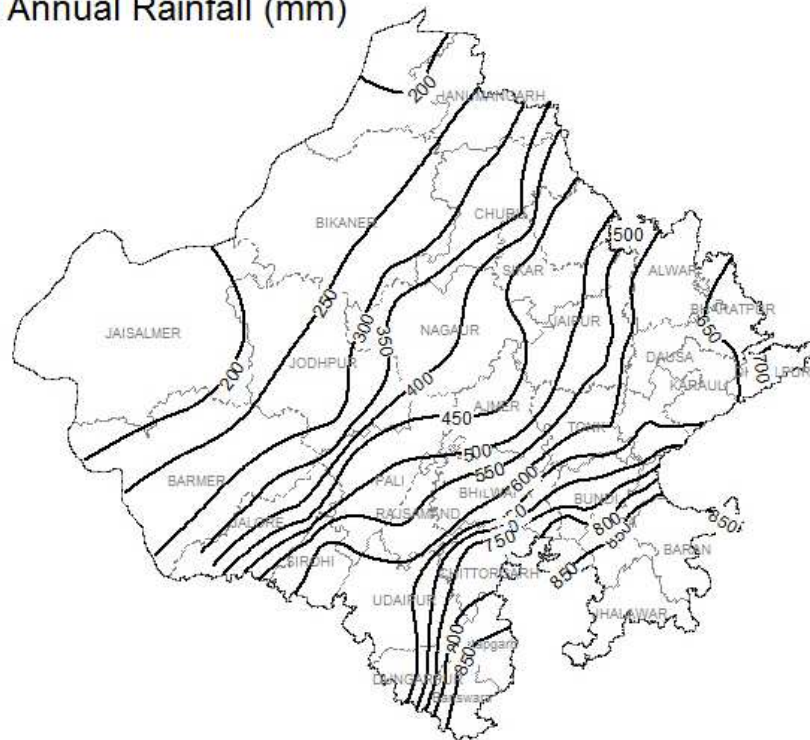


Plate III: Normal Annual Rainfall

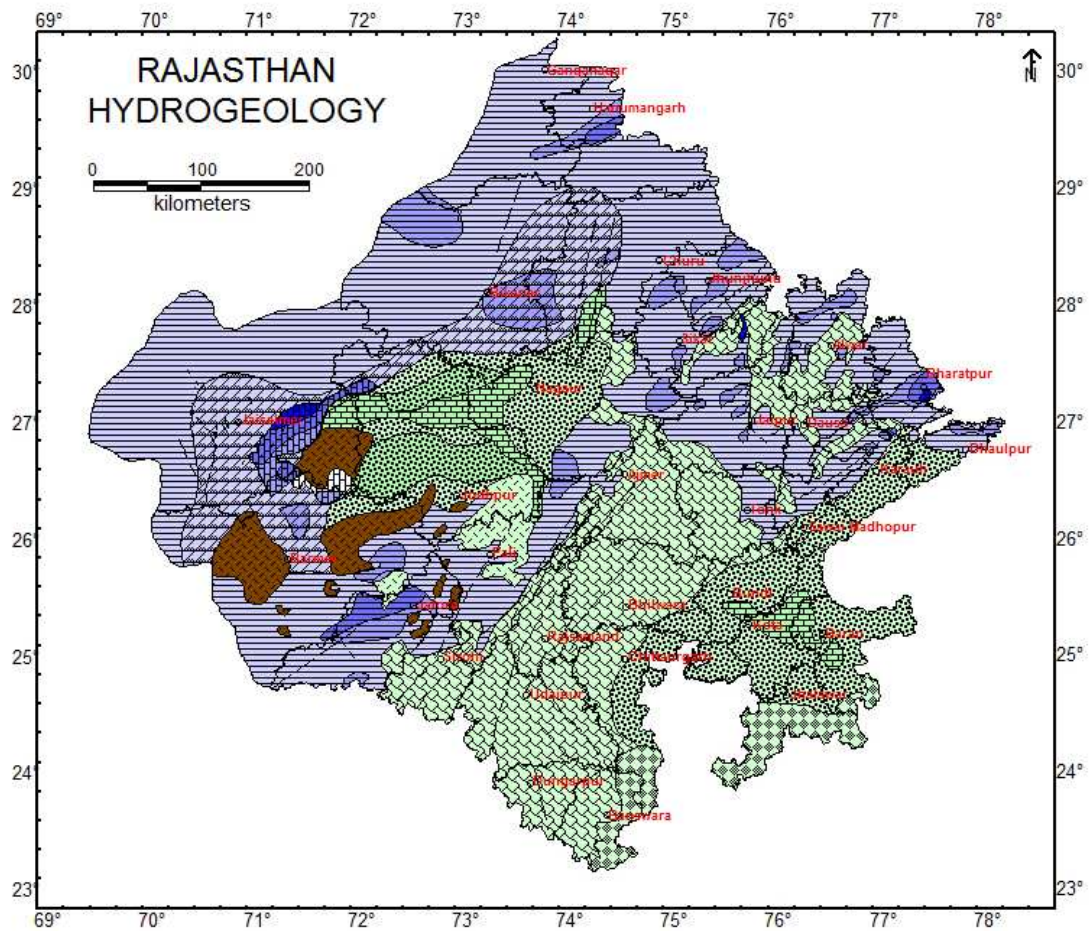


















Plate IV: Hydrogeology

Hydrogeology Legend

	Alluvium, sand, silt clay, unconfined to confined aquifers down to 330 mbgl
	Sandstone, shale & siltstone, unconfined to confined aquifers down to 390 mbgl
	Lathi Sandstone, unconfined to confined aquifers down to 440 mbgl
	Basalt with or without intrertrappean, unconfined to confined aquifers down to 150 mbgl restricted to fractures, vesicular zones and weathered mantle
	Sandstone and shale, unconfined to confined aquifers down to 375 mbgl
	Limestone & dolomite, unconfined to semiconfined aquifers down to 284 mbgl restricted to caverns, fractures and weathered mantle
	Granite & rhyolite, unconfined aquifers down to 80 mbgl restricted to weathered mantle and fractures
	Quartzite, slate, phyllite, schist & gneiss, unconfined to semiconfined aquifers down to 150 mbgl restricted to fractures and weathered mantle

Ground Water Potential (Yield in litres/Sec)

	1 - 10		10 - 25	Aquifers with primary intergranular porosity
	25 - 40		> 40	
	1 - 5		5 - 25	Aquifers with secondary intergranular porosity & fracture
	< 1			
	Lineament			Regions generally with limited ground water, compact formation with less intergranular porosity & fracture

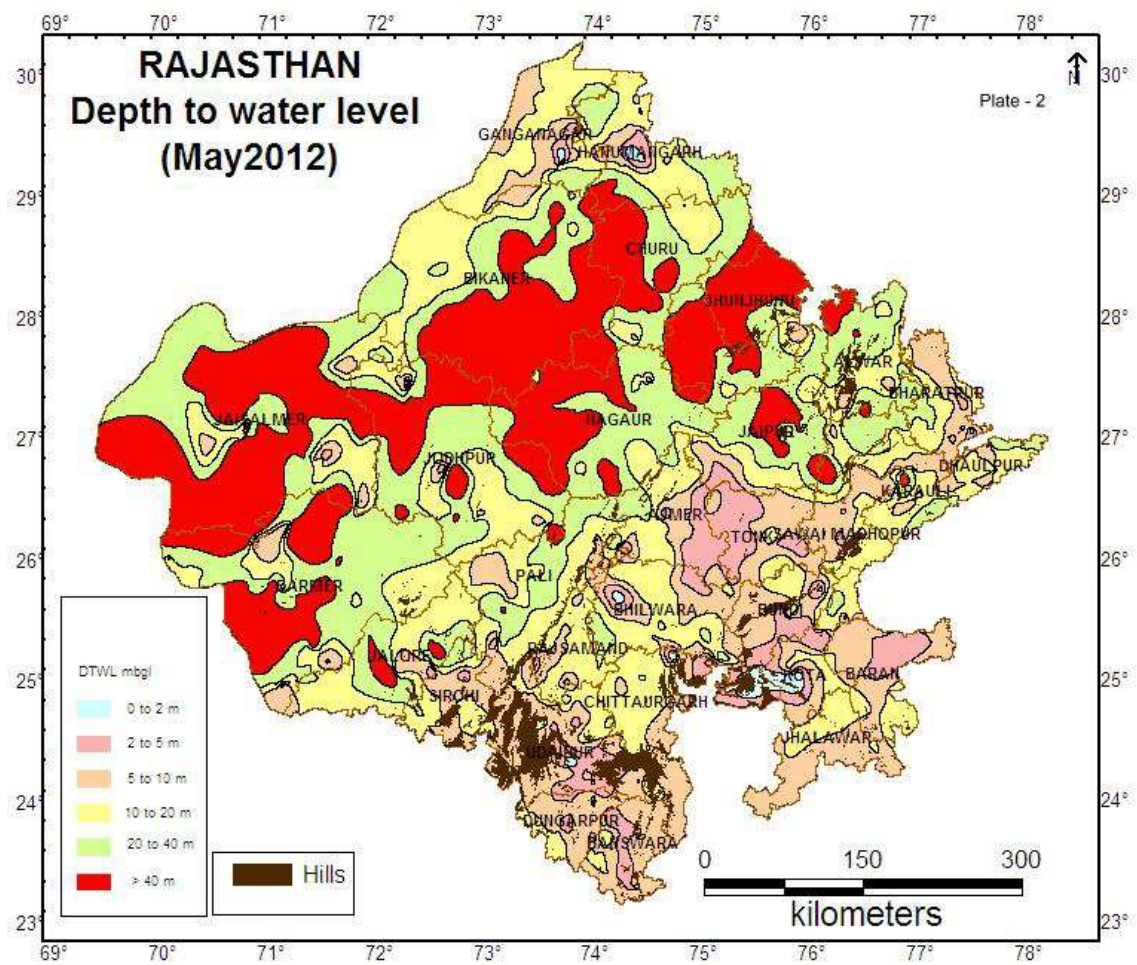


Plate V: Depth to Water Level (Pre-monsoon 2012)

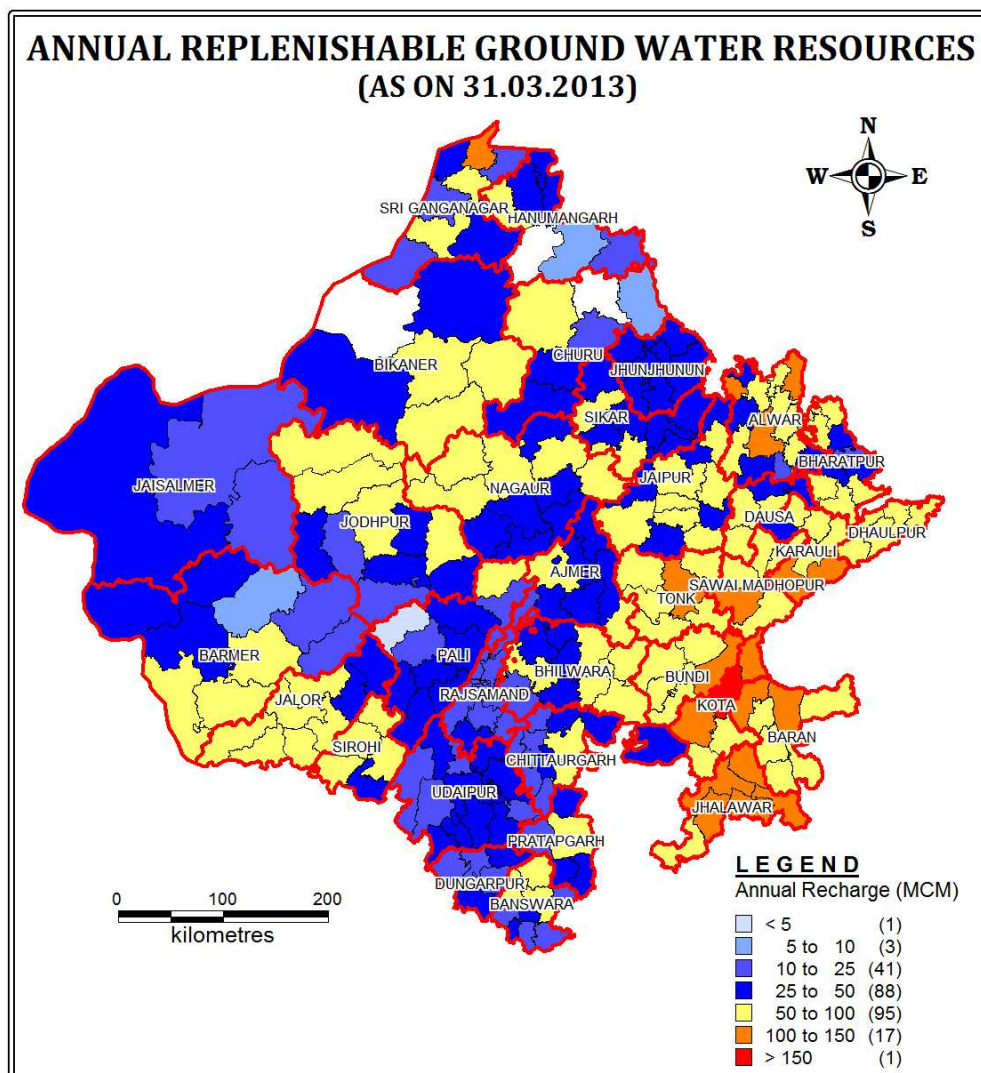


Plate VI: Annual Replenishable Ground Water Resources

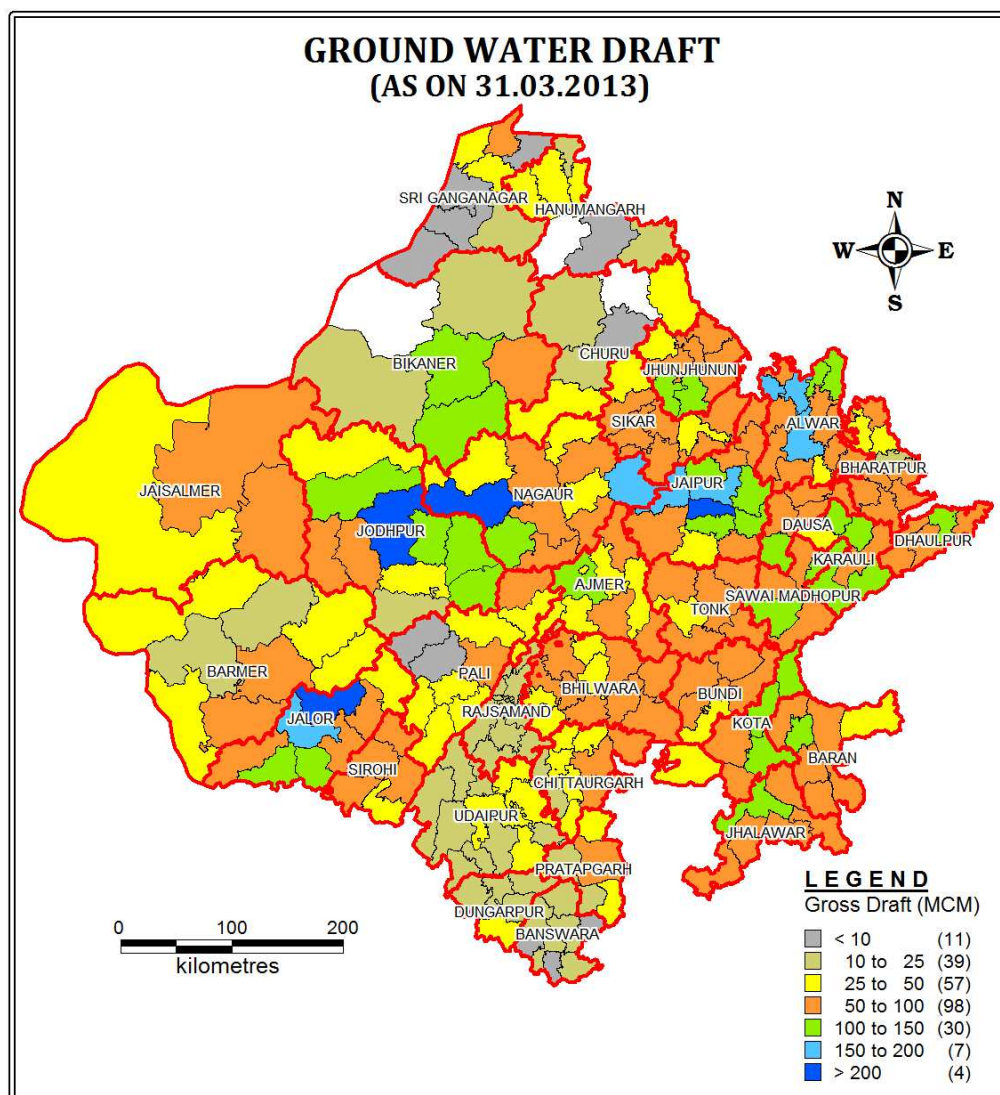


Plate VII: Ground Water Draft

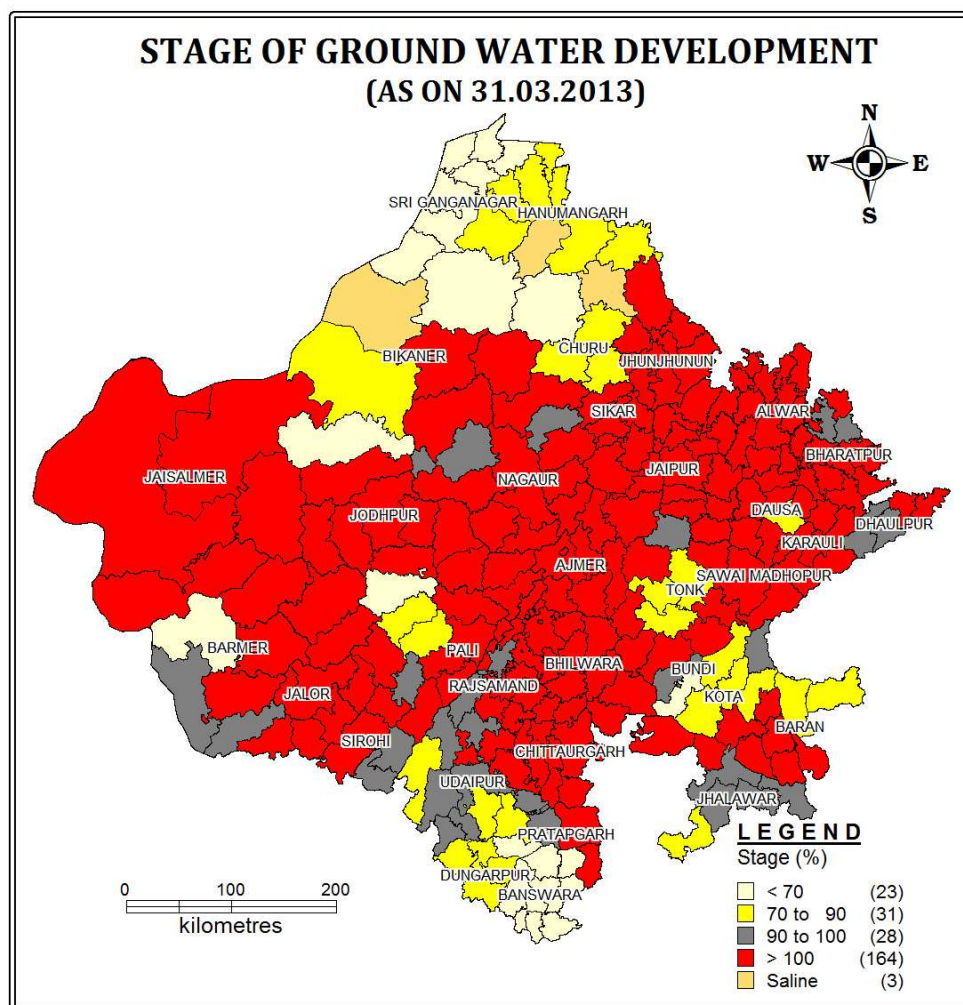


Plate VIII: Stage of Ground Water Development

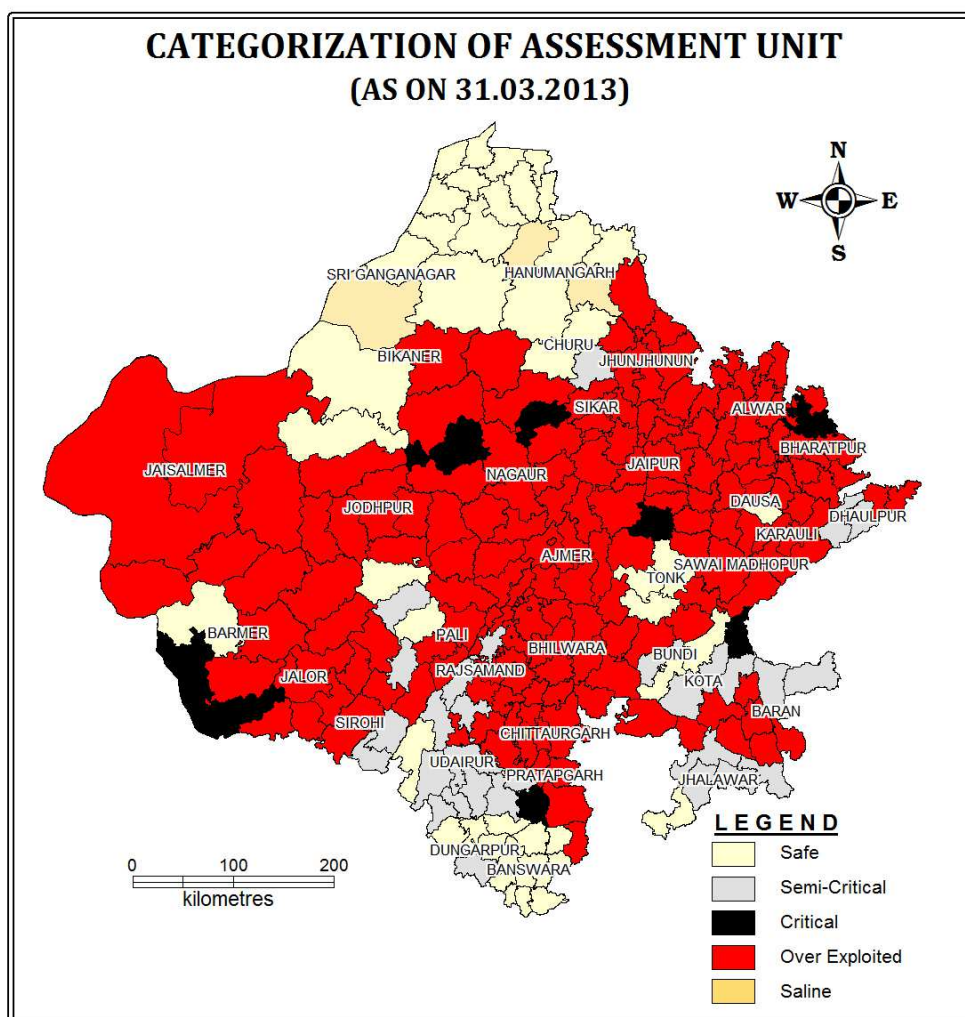


Plate IX: Category of Blocks

Order of Government of Rajasthan for Constitution of Committee

GOVERNMENT OF RAJASTHAN
ADMINISTRATIVE REFORMS (GROUP-3) DEPARTMENT

No.F. 6(33)AR/Gr-3/2014

Jaipur, Dated: 28-10-2014

ORDER

Sub:- State Level Committee for re-estimation of ground water resources-reg.

The National Water Policy, 2002 has recommended that the ground water resources of the country should be re-assessed periodically. The last assessment of state-wise annual replenishable ground water resources for the entire country was made as on 31.03.2011 based on the Methodology adopted by the Ground Water Resources Estimation Committee-1997. Since then changes in ground water scenario in many parts of the country has been observed.

Now therefore H.E. the Governor of Rajasthan is pleased to accord sanction for constitution of a State Level Committee on Ground Water Resources Assessment as on 31.03.2013 for the state as follows:-

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


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

1. To estimate annual replenishable ground water resources of the State in accordance with the Ground Water Resources Estimation Methodology of CGWB.
2. To estimate the status of utilization of the annual replenishable ground water resources.

Time frame : The Committee will submit its report within 6 months from the date of its constitution.

The administrative department of this Committee will be Ground Water Department.

By Order,


(Narendra Kumar Nainawat)
Dy. Secretary to Govt.

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

1. Principal Secretary, H.E. the Governor of Rajasthan, Jaipur.
2. Secretary, Hon'ble Chief Minister, Rajasthan, Jaipur.
3. P.S. to Minister, Water Resources, PHED & GWD, Jaipur.
4. P.S. to Chief Secretary, Rajasthan, Jaipur.
5. P.S. to Principal Secretary, PHED & GWD, Jaipur.
6. P.S. to Secretary, Energy Deptt., Jaipur.
7. P.S. to Commissioner, Industries Deptt., Jaipur.
8. P.S. to Commissioner, Agriculture Deptt., Jaipur.
9. Chief Engineer, SWRPD, JLN Marg, Jaipur.
10. Chief Engineer, Water Resources Department, Jaipur.
11. Chief Engineer (HQ), PHED, Jal Bhawan, 2-Civil Line, Jaipur.
12. Chief Engineer (Rural), PHED, Jal Bhawan, 2-Civil Line, Jaipur.
13. Chief Engineer, Ground Water Department, Jodhpur.
14. General Manager, NABARD, Nehru Palace, Tonk Road, Jaipur.
15. Regional Director, Central Ground Water Board, Western Region, 6A-Jhalana Doongri, Jaipur.
16. Sr. Deputy Secretary to Government, GWD, State Secretariat, Jaipur along with spare copies of Order to deliver to all concerned.
17. Guard File.


Section Officer

BLOCKWISE GROUND WATER RESOURCES OF RAJASTHAN AS ON 31-03-2013 (FRESH GROUND WATER)

Appendix II

S.No.	District	Block	Area of Block	Potential Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development	Whether significant decline in Pre-monsoon Water Level	Whether significant decline in Post-monsoon Water Level	Category of Block
			(Sq.km.)	(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)	(Yes/No)	(Yes/No)	
1	Ajmer	Arain	1194.40	1064.01	45.4517	4.5452	40.9065	42.8634	3.9694	46.8328	3.9694	0.0000	114.49	YES	YES	OVER EXPLOITED
2	Ajmer	Bhinai	1216.19	1150.82	49.3181	4.9318	44.3863	46.1352	4.0533	50.1885	4.0533	0.0000	113.07	YES	YES	OVER EXPLOITED
3	Ajmer	Jawaja	674.51	484.33	21.8494	2.1850	19.6644	22.8732	6.5428	29.4160	6.5426	0.0000	149.59	YES	YES	OVER EXPLOITED
4	Ajmer	Kekri	985.92	889.67	55.4547	3.8829	51.5718	84.0324	4.9805	89.0129	4.9805	0.0000	172.60	YES	YES	OVER EXPLOITED
5	Ajmer	(Silora)	1245.09	1012.88	49.1238	4.9124	44.2114	54.6984	4.7341	59.4325	4.7340	0.0000	134.43	YES	YES	OVER EXPLOITED
6	Ajmer	Masuda	891.99	817.00	35.8287	3.5829	32.2458	33.9672	3.7621	37.7293	3.7621	0.0000	117.01	YES	YES	OVER EXPLOITED
7	Ajmer	Peesangan	1239.91	1108.05	61.3554	5.8284	55.5270	106.3695	9.4226	115.7921	9.4224	0.0000	208.53	YES	YES	OVER EXPLOITED
8	Ajmer	Srinagar	1032.99	940.00	35.3552	3.2067	32.1485	33.0642	9.9364	43.0006	10.3426	0.0000	133.76	YES	YES	OVER EXPLOITED
9	Alwar	Bansur	664.43	604.12	117.5048	11.7505	105.7543	164.7300	6.8255	171.5555	5.5800	0.0000	162.22	YES	YES	OVER EXPLOITED
10	Alwar	Behror	351.69	334.60	33.7427	1.6872	32.0555	84.8178	9.3637	94.1815	9.0300	0.0000	293.81	YES	YES	OVER EXPLOITED
11	Alwar	Kathumar	569.99	362.35	42.9883	4.2988	38.6895	78.3180	5.1772	83.4952	8.0500	0.0000	215.81	YES	YES	OVER EXPLOITED
12	Alwar	Kishangarh Bas	526.46	413.22	64.2925	6.1923	58.1002	85.6920	9.1331	94.8251	8.9276	0.0000	163.21	YES	YES	OVER EXPLOITED
13	Alwar	Kotkasim	344.43	306.59	62.9430	6.2943	56.6487	95.2140	6.1342	101.3482	3.3200	0.0000	178.91	YES	YES	OVER EXPLOITED
14	Alwar	Laxmangarh	623.95	415.01	55.0071	5.5007	49.5064	90.3122	3.1514	93.4636	7.9000	0.0000	188.79	YES	YES	OVER EXPLOITED
15	Alwar	Mandawar	577.26	545.78	94.6857	9.4686	85.2171	151.5960	7.5821	159.1781	5.3800	0.0000	186.79	YES	YES	OVER EXPLOITED
16	Alwar	Neemrana	378.82	327.43	48.4244	4.8424	43.5820	67.9830	6.9974	74.9804	4.4500	0.0000	172.04	YES	YES	OVER EXPLOITED
17	Alwar	Rajgarh	1034.21	455.95	36.6884	2.3200	34.3684	54.3201	5.1658	59.4859	9.5503	0.0000	173.08	YES	YES	OVER EXPLOITED
18	Alwar	Ramgarh	616.97	568.46	57.7706	2.8885	54.8821	92.6220	6.9547	99.5767	6.2400	0.0000	181.44	YES	YES	OVER EXPLOITED
19	Alwar	Reni	392.05	331.04	21.6730	1.7406	19.9324	42.0201	3.5299	45.5500	3.0700	0.0000	228.52	YES	YES	OVER EXPLOITED
20	Alwar	Thanagazi	1060.33	752.33	69.6476	4.4705	65.1771	60.0420	6.4642	66.5062	5.0600	0.5035	102.04	YES	YES	OVER EXPLOITED
21	Alwar	Tijara	673.48	611.52	106.4401	10.6440	95.7961	136.0350	9.4820	145.5170	14.4800	0.0000	151.90	YES	YES	OVER EXPLOITED
22	Alwar	Umren	906.39	796.81	127.5838	12.2550	115.3288	158.3520	40.6848	199.0368	29.7847	0.0000	172.58	YES	YES	OVER EXPLOITED
23	Banswara	Anandpuri	337.40	329.38	16.5117	2.4768	14.0349	7.6290	1.6907	9.3197	1.7825	4.6234	66.40	NO	NO	SAFE
24	Banswara	Bagidora	522.34	500.49	38.0177	5.7026	32.3151	17.0979	2.7098	19.8077	2.8819	12.3353	61.30	NO	NO	SAFE
25	Banswara	(Talwara)	759.93	615.93	58.2040	8.7306	49.4734	19.8951	3.7290	23.6241	5.2607	24.3176	47.75	NO	NO	SAFE
26	Banswara	Chhoti Sarwan	383.37	294.95	23.2623	3.4893	19.7730	5.9952	1.1519	7.1471	1.8561	11.9217	36.15	NO	NO	SAFE
27	Banswara	Garhi	710.55	700.44	50.5114	7.5767	42.9347	13.8489	3.8369	17.6858	4.3532	24.7326	41.19	NO	NO	SAFE
28	Banswara	Ghatol	778.40	680.91	53.8436	8.0765	45.7671	13.2510	3.0386	16.2896	3.6949	28.8212	35.59	NO	NO	SAFE
29	Banswara	Kushalgarh	651.80	507.89	24.1635	3.6245	20.5390	12.8130	1.4629	14.2759	2.2570	5.4690	69.51	NO	NO	SAFE
30	Banswara	Sajjangarh	392.29	349.97	13.8147	2.0722	11.7425	4.8498	1.7090	6.5588	2.1552	4.7375	55.85	NO	NO	SAFE
31	Baran	Anta	949.01	949.00	115.3047	11.5305	103.7742	81.0619	10.8702	91.9321	17.0856	28.2257	88.59	No	No	SEMICRITICAL
32	Baran	Atru	860.30	846.47	68.2245	6.8225	61.4020	83.1984	8.0532	91.2516	17.7015	0.0000	148.61	Yes	Yes	OVER EXPLOITED
33	Baran	Baran	626.21	626.21	85.6228	8.5624	77.0604	119.1279	9.6924	128.8203	16.4270	0.7444	167.17	Yes	Yes	OVER EXPLOITED
34	Baran	Chhabra	790.79	773.37	63.3746	6.3374	57.0372	68.6660	5.3746	74.0406	8.6386	2.3031	129.81	Yes	Yes	OVER EXPLOITED
35	Baran	Chhipabarod	828.76	804.50	63.4963	6.3497	57.1466	89.9167	6.0929	96.0096	10.6626	0.0000	168.01	Yes	No	OVER EXPLOITED
36	Baran	Kishanganj	1430.98	1429.72	105.9200	10.5920	95.3280	76.2360	4.7560	80.9920	8.3230	15.0177	84.96	Yes	No	SEMICRITICAL
37	Baran	Shahbad	1469.26	1462.94	59.7749	5.9775	53.7974	36.7320	6.2843	43.0163	10.9975	8.4098	79.96	No	Yes	SEMICRITICAL
38	Barmer	Baetu	3228.03	476.56	6.8809	0.6881	6.1928	3.7408	10.3140	14.0548	10.3140	0.0000	226.95	YES	YES	OVER EXPLOITED
39	Barmer	Balotra	3513.87	852.32	24.0621	2.4062	21.6559	25.6176	9.5643	35.1819	8.8543	0.6243	162.46	YES	YES	OVER EXPLOITED
40	Barmer	Barmer	3841.58	1986.88	26.2564	1.6129	24.6435	5.6872	6.8900	12.5772	5.8786	13.0777	51.04	NO	NO	SAFE
41	Barmer	Chothtan	3306.26	2135.94	52.4645	5.2464	47.2181	36.4752	9.7143	46.1895	8.8301	1.9128	97.82	YES	YES	CRITICAL
42	Barmer	Dhorimanna	2688.80	2125.06	51.6063	5.1606	46.4457	58.4760	6.1179	64.5939	6.1179	0.0000	139.07	YES	YES	OVER EXPLOITED
43	Barmer	Sheo	6667.49	2654.76	19.0150	1.9013	17.1137	14.3736	16.9734	31.3470	16.2315	2.1267	183.17	YES	YES	OVER EXPLOITED
44	Barmer	Sindhari	3115.73	1078.13	45.7997	3.7694	42.0303	36.5928	5.8941	42.4869	5.9029	3.8658	101.09	YES	YES	OVER EXPLOITED
45	Barmer	Siwana	2025.24	1425.00	51.9272	5.1927	46.7345	62.5472	3.1680	65.7152	3.1680	0.0000	140.61	YES	YES	OVER EXPLOITED
46	Bharatpur	Bayana	808.69	676.31	91.8904	8.6411	83.2493	81.2424	8.0077	89.2501	11.1400	6.2939	107.21	YES	YES	OVER EXPLOITED
47	Bharatpur	Deeg	492.85	338.91	46.6630	4.6663	41.9967	36.2772	4.8231	41.1003	10.9600	0.0000	97.87	YES	YES	CRITICAL

S.No.	District	Block	Area of Block	Potential Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development	Whether significant decline in Pre-monsoon Water Level	Whether significant decline in Post-monsoon Water Level	Category of Block
			(Sq.km.)	(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)	(Yes/No)	(Yes/No)	
48	Bharatpur	Kaman	562.49	492.93	71.9168	7.1917	64.7251	59.8059	5.7002	65.5061	11.5300	0.0000	101.21	NO	YES	OVER EXPLOITED
49	Bharatpur	Kumher	454.51	119.08	18.1941	1.8194	16.3747	13.1556	5.0574	18.2130	6.0800	0.0000	111.23	YES	YES	OVER EXPLOITED
50	Bharatpur	Nadbai	446.70	281.34	43.8730	4.3873	39.4857	65.6820	5.1728	70.8548	6.6900	0.0000	179.44	YES	YES	OVER EXPLOITED
51	Bharatpur	Nagar Pahari	623.80	291.36	53.2307	5.3231	47.9076	40.3920	6.4715	46.8635	5.0000	2.5156	97.82	YES	YES	CRITICAL
52	Bharatpur	Rupbas	539.01	501.10	73.3922	6.6966	66.6956	68.1678	5.9002	74.0680	4.8900	0.0000	111.05	YES	YES	OVER EXPLOITED
53	Bharatpur	Sewar	509.52	281.10	45.3855	4.5386	40.8469	40.0404	16.2750	56.3154	12.2900	0.0000	137.87	YES	YES	OVER EXPLOITED
54	Bharatpur	Weir	606.53	430.39	61.5200	5.7965	55.7235	69.5298	11.1402	80.6700	9.8000	0.0000	144.77	YES	YES	OVER EXPLOITED
55	Bhilwara	Asind	1136.10	990.46	37.3310	3.7331	33.5979	50.1780	3.0899	53.2679	2.6882	0.0000	158.55	YES	NO	OVER EXPLOITED
56	Bhilwara	Banera	687.80	662.58	35.2596	3.4334	31.8262	32.6376	2.7155	35.3531	2.2733	0.0000	111.08	YES	NO	OVER EXPLOITED
57	Bhilwara	Hurda	621.80	612.76	26.2749	2.6275	23.6474	27.9222	3.0124	30.9346	1.9872	0.0000	130.82	YES	NO	OVER EXPLOITED
58	Bhilwara	Jahazpur	1089.70	865.87	54.4817	5.4482	49.0335	73.5450	3.9569	77.5019	2.1353	0.0000	158.06	YES	NO	OVER EXPLOITED
59	Bhilwara	Kotri	934.00	898.31	50.6735	4.3237	46.3498	48.5760	3.5340	52.1100	1.5766	0.0364	112.43	YES	NO	OVER EXPLOITED
60	Bhilwara	Mandal	1234.20	1155.95	52.1007	5.2100	46.8907	61.0974	4.5361	65.6335	3.5348	0.0000	139.97	YES	NO	OVER EXPLOITED
61	Bhilwara	Mandalgarh	1499.10	1032.73	67.6011	6.7600	60.8411	76.4991	3.8181	80.3172	3.7609	0.0000	132.01	YES	NO	OVER EXPLOITED
62	Bhilwara	Raipur	524.20	486.36	21.6204	2.1620	19.4584	31.6056	1.9117	33.5173	1.7666	0.0000	172.25	YES	NO	OVER EXPLOITED
63	Bhilwara	Sahara	653.90	634.69	22.4427	2.1562	20.2865	27.7329	2.6579	30.3908	1.9079	0.0000	149.81	YES	NO	OVER EXPLOITED
64	Bhilwara	Shahpura	1159.30	1125.13	59.6312	5.2138	54.4174	72.6039	2.8796	75.4835	2.8680	0.0000	138.71	YES	NO	OVER EXPLOITED
65	Bhilwara	Suwana	914.90	890.01	48.8379	4.8839	43.9540	56.9655	11.2387	68.2042	4.4707	0.0000	155.17	YES	NO	OVER EXPLOITED
66	Bikaner	Bikaner	3824.76	3191.00	61.4431	3.0722	58.3709	85.0560	26.6688	111.7248	42.3253	15.0639	191.40	YES	YES	OVER EXPLOITED
67	Bikaner	Dungargarh	6328.02	2703.88	52.2121	2.6105	49.6016	50.8170	16.9840	67.8010	9.6444	2.7028	136.69	YES	YES	OVER EXPLOITED
68	Bikaner	Kolayat	5453.24	1924.00	30.5339	1.5267	29.0072	13.6536	10.0416	23.6952	7.9130	8.1552	81.69	NO	NO	SAFE
69	Bikaner	Lunkaransar	3003.90	2071.00	36.2716	1.8136	34.4580	10.3656	7.0320	17.3976	8.3926	15.6998	50.49	NO	NO	SAFE
70	Bikaner	Nokha	7970.86	3712.63	74.3825	3.7191	70.6634	109.4376	28.7606	138.1982	19.4682	3.4660	195.57	YES	YES	OVER EXPLOITED
71	Bundi	Bundi	1175.13	773.11	81.4297	14.8522	66.5775	55.4459	4.7458	60.1917	6.7437	10.5621	90.41	YES	NO	SEMICRITICAL
72	Bundi	Hindoli	1275.30	884.81	76.9537	10.4091	66.5446	70.4208	6.3297	76.7505	6.6015	2.9320	115.34	YES	NO	OVER EXPLOITED
73	Bundi	Keshorai Patan	1243.51	1152.88	127.6376	12.7637	114.8739	93.2446	5.8013	99.0459	12.3404	18.1601	86.22	NO	NO	SAFE
74	Bundi	Nainwa	1095.19	966.85	61.1856	6.1186	55.0670	55.4484	8.3209	63.7693	9.8663	0.0000	115.80	YES	NO	OVER EXPLOITED
75	Bundi	Talera	710.87	462.53	57.1982	10.9344	46.2638	30.1292	2.1017	32.2309	2.3491	17.7390	69.67	NO	NO	SAFE
76	Chittaurgarh	Bari Sadri	504.68	428.38	22.7650	2.2765	20.4885	29.5236	1.1430	30.6666	3.7690	0.0000	149.68	YES	NO	OVER EXPLOITED
77	Chittaurgarh	Begun	970.35	626.85	43.5250	4.3526	39.1724	57.3240	1.2102	58.5342	4.2650	0.0000	149.43	YES	NO	OVER EXPLOITED
78	Chittaurgarh	Bhadesar	539.06	492.53	28.0506	2.8051	25.2455	37.2856	0.7895	38.0751	3.1109	0.0000	150.82	YES	NO	OVER EXPLOITED
79	Chittaurgarh	Bhainsrogarh	1605.46	779.36	35.9502	2.3968	33.5534	36.2730	0.3899	36.6629	4.6080	0.0000	109.27	YES	NO	OVER EXPLOITED
80	Chittaurgarh	Bhopalsagar	398.24	382.12	20.5835	2.0584	18.5251	19.9986	0.5823	20.5809	2.2267	0.0000	111.10	YES	NO	OVER EXPLOITED
81	Chittaurgarh	Chittaurgarh	951.33	741.32	63.0528	6.3054	56.7474	75.8844	5.2428	81.1272	13.5130	0.0000	142.96	YES	NO	OVER EXPLOITED
82	Chittaurgarh	Dungla	494.00	465.43	23.9015	2.3902	21.5113	23.6982	0.6253	24.3235	2.6769	0.0000	113.07	YES	NO	OVER EXPLOITED
83	Chittaurgarh	Gangrar	555.64	536.62	26.6273	2.6627	23.9646	29.4249	0.4804	29.9053	2.6067	0.0000	124.79	YES	NO	OVER EXPLOITED
84	Chittaurgarh	Kapasan	515.92	502.01	23.4220	2.3421	21.0799	31.7802	0.9065	32.6867	4.0264	0.0000	155.06	YES	NO	OVER EXPLOITED
85	Chittaurgarh	Nimbahera	895.35	702.81	70.4011	7.0401	63.3610	82.6336	2.8999	85.5335	7.2710	0.0000	134.99	YES	NO	OVER EXPLOITED
86	Chittaurgarh	Rashmi	449.97	437.57	22.4478	2.2448	20.2030	25.3990	0.7055	26.1045	2.2859	0.0000	129.21	YES	NO	OVER EXPLOITED
87	Churu	Churu	1606.87	484.38	10.3453	0.5173	9.8280	4.1412	4.5045	12.0022	0.0000	0.0000	87.97	NO	NO	SAFE
88	Churu	Rajgarh	2224.92	324.25	8.1631	0.4082	7.7549	24.3456	4.7320	29.0776	8.7821	0.0000	374.96	YES	YES	OVER EXPLOITED
89	Churu	Ratangarh	1622.41	1045.30	28.4327	1.4217	27.0110	15.0300	5.0651	20.0951	13.9001	0.1752	74.40	NO	NO	SAFE
90	Churu	Sardarshahar	3860.80	2123.76	59.3164	2.9657	56.3507	15.8100	6.6138	22.4238	14.7241	30.2925	39.79	NO	NO	SAFE
91	Churu	Sujangarh	2667.55	1214.05	35.5645	1.7782	33.7863	40.1310	4.3746	44.5056	8.3880	0.0000	131.73	YES	YES	OVER EXPLOITED
92	Dausa	Bandikui	632.94	528.90	38.6980	3.8697	34.8283	72.3347	4.0693	76.4040	4.7453	0.0000	219.37	YES	YES	OVER EXPLOITED
93	Dausa	Dausa	943.76	894.74	75.9915	7.5991	68.3924	70.6314	9.2990	79.9304	10.8039	0.0000	116.87	YES	YES	OVER EXPLOITED
94	Dausa	Lalsot	871.24	780.36	67.4113	6.7411	60.6702	121.3560	3.2861	124.6421	3.1670	0.0000	205.44	YES	YES	OVER EXPLOITED
95	Dausa	Mahwa	470.00	442.00	37.9213	3.7921	34.1292	46.6905	4.6144	51.3049	5.3420	0.0000	150.33	YES	YES	OVER EXPLOITED

S.No.	District	Block	Area of Block	Potential Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development	Whether significant decline in Pre-monsoon Water Level	Whether significant decline in Post-monsoon Water Level	Category of Block
			(Sq.km.)	(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)	(Yes/No)	(Yes/No)	
96	Dausa	Sikrai	502.23	439.62	62.4022	6.0863	56.3159	79.2168	4.2734	83.4902	5.0030	0.0000	148.25	YES	YES	OVER EXPLOITED
97	Dhaulpur	Bari	816.24	694.67	74.4954	5.1386	69.3568	55.5083	7.9008	63.4091	8.3457	6.8405	91.42	YES	NO	SEMICRITICAL
98	Dhaulpur	Baseri	1001.42	813.90	82.4505	5.5754	76.8751	66.5461	6.5641	73.1102	7.7803	10.6754	95.10	YES	NO	SEMICRITICAL
99	Dhaulpur	Dholpur	609.32	488.85	77.5335	6.9686	70.5649	118.1673	7.8468	126.0141	13.4111	0.0000	178.58	YES	YES	OVER EXPLOITED
100	Dhaulpur	Rajakhera	582.07	488.72	65.0262	6.5026	58.5236	69.3000	6.8335	76.1335	6.2400	0.0000	130.09	YES	YES	OVER EXPLOITED
101	Dungarpur	Aspur	675.95	499.24	34.4807	2.2161	32.2645	14.9430	1.4473	16.3903	6.1517	11.7034	50.80	NO	NO	SAFE
102	Dungarpur	Bichhiwara	704.97	436.59	23.6459	2.3646	21.2813	15.8460	1.5139	17.3599	7.5918	0.0000	81.57	NO	NO	SAFE
103	Dungarpur	Dungarpur	552.00	366.74	17.7188	1.7719	15.9469	11.6964	1.8941	13.5905	6.3425	0.0000	85.22	NO	NO	SAFE
104	Dungarpur	Sagwara	590.12	404.58	24.7951	2.4795	22.3155	14.6076	2.1073	16.7149	7.2097	1.2700	74.90	NO	NO	SAFE
105	Dungarpur	Simalwara	1246.96	926.98	46.1327	4.6132	41.5194	29.6640	2.0803	31.7443	8.4572	3.3982	76.46	YES	NO	SEMICRITICAL
106	Ganganagar	Anupgarh	2388.42	516.74	97.5048	9.7505	87.7543	7.0650	0.2800	7.3450	0.7000	79.9893	8.37	NO	NO	SAFE
107	Ganganagar	Ganganagar	866.65	242.40	118.4942	11.8494	106.6448	65.1075	1.0500	66.1575	2.6250	38.9123	62.04	NO	NO	SAFE
108	Ganganagar	Gharsana	1387.32	125.00	18.6345	1.8635	16.7710	3.7650	0.1400	3.9050	0.3500	12.6560	23.28	NO	NO	SAFE
109	Ganganagar	Karanpur	826.83	249.70	47.8149	4.7815	43.0334	25.7625	1.0500	26.8125	2.6250	14.6459	62.31	NO	NO	SAFE
110	Ganganagar	Padampur	846.91	146.40	52.6667	5.2667	47.4000	26.7000	0.7560	27.4560	1.8900	18.8100	57.92	NO	NO	SAFE
111	Ganganagar	Raisinghnagar	1368.32	96.30	22.0682	2.2068	19.8614	8.1840	0.4620	8.6460	1.1550	10.5224	43.53	NO	NO	SAFE
112	Ganganagar	Sadulshahar	892.67	31.50	21.1874	2.1187	19.0687	6.6000	0.0000	6.6000	0.0000	12.4687	34.61	NO	NO	SAFE
113	Ganganagar	Suratgarh	3026.53	137.60	25.7552	2.5756	23.1796	14.0850	2.2050	16.2900	5.5125	7.1213	70.28	NO	NO	SAFE
114	Hanumangarh	Bhadra	1776.80	158.10	17.9515	1.7952	16.1563	10.2480	2.1875	12.4355	3.2813	2.6271	76.97	NO	NO	SAFE
115	Hanumangarh	Hanumangarh	1112.38	245.21	39.6686	3.9669	35.7017	28.7745	1.3125	30.0870	1.9688	4.9585	84.27	NO	NO	SAFE
116	Hanumangarh	Nohar	2439.45	57.10	9.7676	0.9768	8.7908	7.6596	0.1260	7.7856	0.1890	0.9422	88.57	NO	NO	SAFE
117	Hanumangarh	Pilibanga	1128.02	392.24	53.6784	5.3678	48.3106	40.5046	1.9250	42.4296	2.8875	4.9185	87.83	NO	NO	SAFE
118	Hanumangarh	Sangaria	693.19	180.76	27.3480	2.7348	24.6132	20.5602	0.7140	21.2742	1.0710	2.9820	86.43	NO	NO	SAFE
119	Hanumangarh	Tibi	757.51	245.09	34.1799	3.4180	30.7619	25.8122	1.2250	27.0372	1.8375	3.1122	87.89	NO	NO	SAFE
120	Jaipur	Amer	898.64	850.48	82.9115	8.2911	74.6204	144.3445	50.2145	194.5590	60.2392	0.0000	260.73	YES	YES	OVER EXPLOITED
121	Jaipur	Bassi	654.69	631.23	45.4433	4.4182	41.0251	88.7314	11.5607	100.2921	13.8687	0.0000	244.46	YES	YES	OVER EXPLOITED
122	Jaipur	Chaksu	811.92	729.36	58.2865	5.8286	52.4579	82.0862	6.2981	88.3843	7.5555	0.0000	168.49	YES	YES	OVER EXPLOITED
123	Jaipur	Dudu	1870.64	1790.87	91.2754	9.1275	82.1479	75.4026	20.6267	96.0293	24.7447	2.1212	116.90	YES	YES	OVER EXPLOITED
124	Jaipur	Govindgarh	685.12	638.08	55.9691	5.5969	50.3722	121.4873	14.0433	135.5306	16.8469	0.0000	269.06	YES	YES	OVER EXPLOITED
125	Jaipur	Jamwa Ramgarh	1033.70	961.88	56.3320	5.6333	50.6987	97.5829	5.7023	103.2852	6.8406	0.0990	203.72	YES	YES	OVER EXPLOITED
126	Jaipur	Jhotwara	568.79	553.04	55.4027	5.5403	49.8624	66.5881	138.1206	204.7087	165.6947	0.0000	410.55	YES	YES	OVER EXPLOITED
127	Jaipur	Kotputli	691.71	572.75	39.4585	3.9459	35.5126	74.0710	9.9145	83.9855	11.8938	0.0000	236.49	YES	YES	OVER EXPLOITED
128	Jaipur	Phagi	1114.34	773.51	49.7472	3.2121	46.5351	39.9105	3.8330	43.7435	4.5982	2.8086	94.00	YES	YES	CRITICAL
129	Jaipur	Sambhar	938.40	831.48	49.7373	4.9737	44.7636	159.6166	11.8276	171.4442	14.1889	0.0000	383.00	YES	YES	OVER EXPLOITED
130	Jaipur	Sanganer	657.54	613.87	54.1203	5.4120	48.7083	96.3934	23.3144	119.7078	27.9689	0.0000	245.76	YES	YES	OVER EXPLOITED
131	Jaipur	Shahpura	429.85	384.14	32.1602	3.2160	28.9442	66.6488	9.1457	75.7945	10.9715	0.0000	261.86	YES	YES	OVER EXPLOITED
132	Jaipur	(Bairath)	706.10	663.98	50.1552	5.0155	45.1397	66.0531	11.3615	77.4146	13.6297	0.0000	171.50	YES	YES	OVER EXPLOITED
133	Jaisalmer	Jaisalmer	11591.00	2510.22	21.8423	1.8582	19.9841	53.2718	13.2167	66.4885	11.2878	3.8811	332.71	YES	YES	OVER EXPLOITED
134	Jaisalmer	Sam	21194.80	7960.65	28.4830	2.8483	25.6347	19.5125	12.6146	32.1271	8.2513	15.2119	125.33	YES	YES	OVER EXPLOITED
135	Jaisalmer	Sankra	5615.20	1619.17	19.8406	1.8395	18.0011	52.8013	6.9010	59.7023	6.0710	4.8415	331.66	YES	YES	OVER EXPLOITED
136	Jalor	Ahore	1613.77	535.24	29.5084	2.5225	26.9859	27.6314	4.8384	32.4698	4.8384	6.3807	120.32	YES	YES	OVER EXPLOITED
137	Jalor	Bhinmal	1365.61	1322.75	75.7983	6.8202	68.9781	151.0069	6.1560	157.1629	6.1560	2.3160	227.85	YES	YES	OVER EXPLOITED
138	Jalor	Chitalwana	1817.85	1075.60	66.9610	3.3481	63.6129	59.3973	1.3452	60.7425	1.8558	2.3598	95.49	YES	YES	CRITICAL
139	Jalor	Jalore	1049.05	834.37	45.1207	4.5121	40.6086	54.5261	5.3952	59.9213	5.7648	0.3712	147.56	YES	YES	OVER EXPLOITED
140	Jalor	Jaswantpura	1058.42	932.37	51.1179	5.1118	46.0061	61.6253	4.0668	65.6921	4.0668	0.0000	142.79	YES	YES	OVER EXPLOITED
141	Jalor	Raniwara	1009.75	918.62	56.5341	5.6535	50.8806	114.4479	4.8996	119.3475	4.9356	0.0799	234.56	YES	YES	OVER EXPLOITED
142	Jalor	Sanchore	1236.90	1236.90	70.6529	6.8066	63.8463	120.6467	7.3896	128.0363	7.3896	0.0000	200.54	YES	YES	OVER EXPLOITED
143	Jalor	Sayla	1488.43	1372.25	71.1140	5.5853	65.5287	200.3400	7.8768	208.2168	7.8768	0.0000	317.75	YES	YES	OVER EXPLOITED

S.No.	District	Block	Area of Block	Potential Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development	Whether significant decline in Pre-monsoon Water Level	Whether significant decline in Post-monsoon Water Level	Category of Block
			(Sq.km.)	(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)	(Yes/No)	(Yes/No)	
144	Jhalawar	Bakani	881.52	865.98	104.4094	19.1581	85.2513	81.4447	2.2702	83.7149	5.4205	6.3344	98.20	No	Yes	SEMICRITICAL
145	Jhalawar	Dag	1132.87	1087.09	93.1078	9.3108	83.7970	70.3620	4.2469	74.6089	0.4518	6.0029	89.04	No	No	SAFE
146	Jhalawar	Jhalrapatan	1341.31	1299.62	118.2272	11.8227	106.4045	101.1132	3.4366	104.5498	1.7885	0.0000	98.26	No	Yes	SEMICRITICAL
147	Jhalawar	Khanpur	949.70	932.90	111.3607	28.3302	83.0305	88.2351	2.7925	91.0276	5.3565	2.8891	109.63	Yes	Yes	OVER EXPLOITED
148	Jhalawar	Manohar Thana	937.46	919.97	111.3310	21.4546	89.8764	84.8130	2.3691	87.1821	5.7306	6.7830	97.00	No	Yes	SEMICRITICAL
149	Jhalawar	Pirawa	1009.94	1000.60	126.3443	27.8973	98.4470	95.8512	2.4556	98.3068	7.6836	11.2775	99.86	No	Yes	SEMICRITICAL
150	Jhunjhunun	Alsisar	837.15	707.37	29.6995	2.9699	26.7296	17.7706	9.1498	26.9204	9.7035	3.2265	100.71	YES	YES	OVER EXPLOITED
151	Jhunjhunun	Buhana	653.30	624.30	35.9100	3.5910	32.3190	45.5782	13.1006	58.6788	10.6266	0.0000	181.56	YES	YES	OVER EXPLOITED
152	Jhunjhunun	Chirawa	493.04	493.04	25.3819	2.5382	22.8437	53.4720	11.4982	64.9702	11.3107	0.0000	284.41	YES	YES	OVER EXPLOITED
153	Jhunjhunun	Jhunjhunun	751.90	744.96	33.1682	3.3168	29.8514	56.5182	15.5900	72.1082	15.9359	0.0000	241.56	YES	YES	OVER EXPLOITED
154	Jhunjhunun	Khetri	831.44	575.83	30.7754	2.1774	28.5980	44.2953	8.3178	52.6131	7.3993	0.0000	183.97	YES	YES	OVER EXPLOITED
155	Jhunjhunun	Nawalgarh	699.80	632.00	36.4829	1.8241	34.6588	87.2147	14.6358	101.8505	12.0604	0.0000	293.87	YES	YES	OVER EXPLOITED
156	Jhunjhunun	Surajgarh	779.09	779.09	36.5550	3.6555	32.8995	67.4730	14.6742	82.1472	11.3719	0.0000	249.69	YES	YES	OVER EXPLOITED
157	Jhunjhunun	Udaipurwati	882.28	717.10	47.6251	4.7626	42.8625	90.3625	17.0849	107.4474	14.4899	0.0000	250.68	YES	YES	OVER EXPLOITED
158	Jodhpur	Balesar	1888.25	1503.03	24.4939	2.4494	22.0445	50.6694	10.4000	61.0694	10.4000	0.0000	277.03	YES	YES	OVER EXPLOITED
159	Jodhpur	Bap	4393.31	3586.92	72.0442	7.2045	64.8397	29.0664	10.5920	39.6584	10.5062	25.2671	61.16	NO	NO	SAFE
160	Jodhpur	Bawari	1387.33	1387.33	31.6027	3.1602	28.4425	121.9460	22.6080	144.5540	22.6080	0.0000	508.23	YES	YES	OVER EXPLOITED
161	Jodhpur	Bhopalgarh	1757.69	1718.69	56.2849	5.6284	50.6565	105.9445	8.3580	114.3025	8.2530	6.7607	225.64	YES	YES	OVER EXPLOITED
162	Jodhpur	Bilara	1504.33	1234.20	44.5016	4.4502	40.0514	100.8410	5.8174	106.6584	6.5488	3.8101	266.30	YES	YES	OVER EXPLOITED
163	Jodhpur	Luni	1978.95	758.78	24.5271	2.1168	22.4103	12.3400	1.0980	13.4380	5.6160	4.4543	59.96	NO	NO	SAFE
164	Jodhpur	Mandor	1260.96	1165.19	29.6062	2.9606	26.6456	39.8272	2.7256	42.5528	2.8932	1.6477	159.70	YES	YES	OVER EXPLOITED
165	Jodhpur	Osian	2861.07	2861.07	60.1642	6.0164	54.1478	174.2298	33.1360	207.3658	33.1360	0.0000	382.96	YES	YES	OVER EXPLOITED
166	Jodhpur	Phalodi	3118.13	3118.13	59.6858	5.9686	53.7172	93.8160	20.1440	113.9600	20.1440	0.0000	212.15	YES	YES	OVER EXPLOITED
167	Jodhpur	Shergarh	2099.98	1534.58	35.9901	3.4227	32.5674	50.6190	13.4100	64.0290	11.8218	9.1518	196.60	YES	YES	OVER EXPLOITED
168	Karauli	Hindaun	637.70	575.20	64.2156	6.1664	58.0492	118.2497	9.7043	127.9540	9.2624	0.0000	220.42	YES	YES	OVER EXPLOITED
169	Karauli	Karauli	1262.09	1084.46	94.4807	9.4480	85.0327	85.8711	9.6461	95.5172	15.4225	0.0000	112.33	YES	YES	OVER EXPLOITED
170	Karauli	Nadoti	650.50	571.06	39.1843	3.7265	35.4578	23.3357	5.5760	28.9117	3.2793	8.0985	81.54	NO	NO	SAFE
171	Karauli	Sapotra	1958.81	1219.49	109.8146	10.1793	99.6353	97.4311	10.0735	107.5046	9.2258	0.4797	107.90	YES	YES	OVER EXPLOITED
172	Karauli	Todabhim	529.50	452.21	51.0097	5.1010	45.9087	96.9822	17.1753	114.1575	16.1846	0.0000	248.66	YES	YES	OVER EXPLOITED
173	Kota	Itawa	898.51	897.51	145.3331	14.5333	130.7998	112.8188	6.0719	118.8907	11.7001	30.1451	90.90	Yes	Yes	CRITICAL
174	Kota	Khairabad	794.26	750.60	54.5348	5.4535	49.0813	63.9104	9.0211	72.9315	12.8100	0.0000	148.59	Yes	Yes	OVER EXPLOITED
175	Kota	Ladpura	1540.80	1521.35	127.0726	12.7072	114.3654	79.4244	14.8030	94.2274	26.6462	11.1760	82.39	Yes	Yes	SEMICRITICAL
176	Kota	Sangod	1057.80	1044.14	82.3609	8.2361	74.1248	121.1211	10.2679	131.3890	27.0030	0.0000	177.25	Yes	Yes	OVER EXPLOITED
177	Kota	Sultanpur	912.57	909.57	167.4174	13.5320	153.8854	119.4619	10.0376	129.4995	12.8351	25.7395	84.15	Yes	Yes	SEMICRITICAL
178	Nagaur	Degana	1463.34	1203.34	41.5772	4.1577	37.4195	52.5990	14.5840	67.1830	15.1320	0.4361	179.54	YES	YES	OVER EXPLOITED
179	Nagaur	Didwana	1637.59	1637.59	64.0105	6.4010	57.6095	77.0125	19.7920	96.8045	20.6191	6.7031	168.04	YES	YES	OVER EXPLOITED
180	Nagaur	Jayal	1948.08	1724.58	58.4688	5.8469	52.6219	37.2475	17.4400	54.6875	18.9600	12.0687	103.93	YES	YES	OVER EXPLOITED
181	Nagaur	Kuchaman city	1507.13	1125.88	69.8514	6.2037	63.6477	159.4623	21.1920	180.6543	21.5001	1.6047	283.83	YES	YES	OVER EXPLOITED
182	Nagaur	Ladnu	1530.08	1448.83	44.5149	4.4515	40.0634	26.7927	13.2093	40.0020	16.6332	8.1652	99.85	YES	YES	CRITICAL
183	Nagaur	Makrana	1140.08	1065.08	42.7148	4.2715	38.4433	28.1600	19.6400	47.8000	13.7675	1.2876	124.34	YES	YES	OVER EXPLOITED
184	Nagaur	Merta	1434.80	1378.55	49.0509	4.2149	44.8360	130.6965	13.6000	144.2965	13.6000	2.3411	321.83	YES	YES	OVER EXPLOITED
185	Nagaur	Mundwa	2207.29	2207.29	70.5936	7.0593	63.5343	188.4880	32.5840	221.0720	32.5840	0.0000	347.96	YES	YES	OVER EXPLOITED
186	Nagaur	Nagaur	2532.90	2270.40	53.2359	5.3236	47.9123	26.6640	19.7280	46.3920	21.9271	8.7713	96.83	YES	YES	CRITICAL
187	Nagaur	Parbatsar	1071.70	1071.70	32.5911	3.2591	29.3320	46.4375	10.2144	56.6519	10.2144	0.0000	193.14	YES	YES	OVER EXPLOITED
188	Nagaur	Riyan	1245.26	1245.26	48.5947	4.8594	43.7353	49.8025	10.9488	60.7513	10.9488	0.0000	138.91	YES	YES	OVER EXPLOITED
189	Pali	Bali	1449.80	943.75	47.0645	4.7064	42.3581	39.9564	2.8526	42.8090	1.8870	4.7412	101.06	YES	YES	OVER EXPLOITED
190	Pali	Desuri	815.40	565.31	30.4005	3.0400	27.3605	27.9384	3.3796	31.3180	3.3796	0.0000	114.46	YES	NO	OVER EXPLOITED
191	Pali	Jaitaran	1377.41	1212.48	60.2316	5.7427	54.4889	59.9736	10.1966	70.1702	10.5173	0.7209	128.78	YES	YES	OVER EXPLOITED

S.No.	District	Block	Area of Block	Potential Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development	Whether significant decline in Pre-monsoon Water Level	Whether significant decline in Post-monsoon Water Level	Category of Block
			(Sq.km.)	(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)	(Yes/No)	(Yes/No)	
192	Pali	Marwar Junction	1404.07	1150.00	37.7677	3.7768	33.9909	46.5596	6.3950	52.9546	6.3950	0.0000	155.79	YES	YES	OVER EXPLOITED
193	Pali	Pali	1387.03	309.43	10.7261	1.0726	9.6535	6.5660	0.2103	6.7763	0.9308	2.2587	70.19	NO	NO	SAFE
194	Pali	Raipur	1092.22	656.25	20.3325	1.8795	18.4530	24.1776	1.9200	26.0976	1.9200	0.0000	141.43	YES	YES	OVER EXPLOITED
195	Pali	Rani	782.04	625.17	30.4448	3.0445	27.4003	30.2258	2.4742	32.7000	2.4742	0.0000	119.34	YES	YES	OVER EXPLOITED
196	Pali	Rohat	1407.75	106.25	4.8098	0.4810	4.3288	3.3740	0.0692	3.4432	0.0715	0.8833	79.54	YES	NO	SEMICRITICAL
197	Pali	Sojat	1681.55	1133.50	35.2391	3.3090	31.9301	35.3898	3.4721	38.8619	3.4721	0.0000	121.71	YES	YES	OVER EXPLOITED
198	Pali	Sumerpur	959.73	660.40	49.6159	4.9616	44.6543	40.7479	2.9674	43.7153	4.4552	5.3231	97.90	YES	NO	SEMICRITICAL
199	Pratapgarh	Arnod	663.07	563.35	32.3542	3.2354	29.1188	38.1822	1.2744	39.4566	3.9584	0.0000	135.50	YES	NO	OVER EXPLOITED
200	Pratapgarh	Chhotisadri	703.04	542.38	32.3252	3.2326	29.0926	40.7579	0.6821	41.4400	5.1559	0.0000	142.44	YES	YES	OVER EXPLOITED
201	Pratapgarh	Dharyabad	882.94	458.56	24.8805	2.4881	22.3924	19.4708	1.4618	20.9326	5.6578	0.0000	93.48	YES	YES	CRITICAL
202	Pratapgarh	Peepalkhoont	840.86	483.50	25.7037	1.2852	24.4185	15.2442	0.7766	16.0208	4.1501	5.0242	65.61	NO	NO	SAFE
203	Pratapgarh	Pratapgarh	1269.89	902.60	56.1223	5.6123	50.5100	60.2025	1.8919	62.0944	9.3203	3.4926	122.93	YES	NO	OVER EXPLOITED
204	Rajsamand	Amet	523.56	465.19	14.4438	1.4444	12.9994	12.6153	2.1309	14.7462	5.9838	0.0000	113.44	YES	NO	OVER EXPLOITED
205	Rajsamand	Bhim	687.39	337.16	12.8121	1.2812	11.5309	11.6900	2.0473	13.7373	4.3697	0.0000	119.13	YES	YES	OVER EXPLOITED
206	Rajsamand	Deogarh	617.01	390.76	13.4613	1.3462	12.1151	10.5332	1.2425	11.7757	3.8490	0.0000	97.20	YES	NO	SEMICRITICAL
207	Rajsamand	Khamnor	791.68	675.86	26.1949	2.6195	23.5754	19.7499	2.9678	22.7177	6.1988	0.6961	96.36	YES	NO	SEMICRITICAL
208	Rajsamand	Kumbhalgarh	788.35	536.56	23.3712	2.3371	21.0341	18.8060	1.9806	20.7866	4.7291	0.0000	98.82	YES	NO	SEMICRITICAL
209	Rajsamand	Railmagra	608.14	600.18	16.0277	1.6028	14.4249	15.5057	1.9458	17.4515	4.2112	0.0000	120.98	YES	NO	OVER EXPLOITED
210	Rajsamand	Rajsamand	619.33	534.38	17.9914	1.7993	16.1921	14.2047	3.1614	17.3661	7.0744	0.0000	107.25	YES	NO	OVER EXPLOITED
211	Sawai Madhopur	Bamanwas	721.10	656.55	78.0920	4.0634	74.0286	69.9555	8.3720	78.3275	8.0014	0.0000	105.81	YES	YES	OVER EXPLOITED
212	Sawai Madhopur	Bonli	1004.50	983.38	72.2909	6.6587	65.6322	55.7298	14.8836	70.6134	16.5984	0.8449	107.59	YES	YES	OVER EXPLOITED
213	Sawai Madhopur	Gangapur	645.50	498.92	69.0800	6.9080	62.1720	88.4376	20.4461	108.8837	19.2056	0.0000	175.13	YES	YES	OVER EXPLOITED
214	Sawai Madhopur	Khandar	1453.81	1178.49	89.3583	5.5423	83.8160	74.1916	12.2587	86.4503	13.5710	2.7426	103.14	YES	YES	OVER EXPLOITED
215	Sawai Madhopur	Sawai Madhopur	1195.74	1008.29	103.5601	10.3560	93.2041	99.3276	25.8222	125.1498	24.4491	0.0000	134.27	YES	YES	OVER EXPLOITED
216	Sikar	Danta Ramgarh	1210.51	1140.45	50.8885	5.0888	45.7997	69.4070	8.2474	77.6544	11.1339	0.0000	169.55	Yes	Yes	OVER EXPLOITED
217	Sikar	Dhod	911.15	904.00	45.0834	4.5083	40.5751	58.9594	6.7981	65.7575	9.1775	0.0000	162.06	Yes	Yes	OVER EXPLOITED
218	Sikar	Fatehpur	1291.23	1258.74	44.2333	4.4233	39.8100	16.4390	11.8211	28.2601	15.9584	7.4125	70.99	Yes	Yes	SEMICRITICAL
219	Sikar	Khandela	743.46	693.99	32.0332	1.9262	30.1070	25.3493	5.8834	31.2327	7.9426	0.0000	103.74	No	No	OVER EXPLOITED
220	Sikar	Lachhmangarh	1051.62	1008.30	50.0998	5.0100	45.0898	50.9693	10.3849	61.3542	14.0196	0.0063	136.07	Yes	Yes	OVER EXPLOITED
221	Sikar	Neem Ka Thana	1197.12	875.18	32.0980	3.2098	28.8882	44.9575	8.6282	53.5857	11.6481	0.0000	185.49	Yes	No	OVER EXPLOITED
222	Sikar	Piprali	807.66	726.18	35.2697	3.5270	31.7427	47.5641	11.7030	59.2671	15.7990	0.0000	186.71	Yes	Yes	OVER EXPLOITED
223	Sikar	Sri Madhopur	668.10	656.62	38.9168	3.8917	35.0251	66.7568	5.6662	72.4230	7.6494	1.1416	206.77	Yes	Yes	OVER EXPLOITED
224	Sirohi	Abu Road	838.17	331.06	28.1058	1.8613	26.2445	23.8320	2.1696	26.0016	3.4986	1.6980	99.07	YES	NO	SEMICRITICAL
225	Sirohi	Pindwara	1156.90	882.90	64.3251	6.2179	58.1072	55.8714	1.7600	57.6314	1.7600	3.7959	99.18	YES	NO	SEMICRITICAL
226	Sirohi	Reodar	1086.76	985.80	69.9104	6.2759	63.6345	88.6848	2.4320	91.1168	2.3296	2.8160	143.19	YES	YES	OVER EXPLOITED
227	Sirohi	Sheoganj	887.42	772.89	66.6071	6.6608	59.9463	70.6524	2.0992	72.7516	2.0992	0.0000	121.36	YES	YES	OVER EXPLOITED
228	Sirohi	Sirohi	1166.75	1103.05	74.7226	7.4722	67.2504	67.4661	2.6240	70.0901	4.4314	3.3249	104.22	YES	NO	OVER EXPLOITED
229	Tonk	Deoli	1242.09	1242.09	92.2433	7.9337	84.3096	61.0669	13.3590	74.4259	16.4250	7.6541	88.28	NO	NO	SAFE
230	Tonk	Malpura	1464.47	1239.72	51.4861	5.1486	46.3375	55.0627	13.0478	68.1105	14.1624	0.0000	146.99	YES	YES.	OVER EXPLOITED
231	Tonk	Niwai	1061.87	1004.57	89.9238	8.9924	80.9314	77.8156	11.6682	89.4838	10.5960	0.0000	110.57	YES	YES.	OVER EXPLOITED
232	Tonk	Todaraisingh	1027.02	911.14	53.8470	3.0892	50.7578	34.6434	5.6429	40.2863	9.0018	7.1126	79.37	NO	NO	SAFE
233	Tonk	Tonk	1414.23	1164.90	114.0147	11.4014	102.6133	70.6991	17.1988	87.8979	26.6912	6.2161	85.66	NO	NO	SAFE
234	Tonk	Unlara	990.38	962.30	85.1938	7.7317	77.4621	65.9051	14.6247	80.5298	15.5891	4.6742	103.96	YES	NO	OVER EXPLOITED
235	Udaipur	Badgaon	466.44	262.84	12.9014	1.2901	11.6113	11.0754	2.2276	13.3030	4.4825	0.0000	114.57	YES	NO	OVER EXPLOITED
236	Udaipur	Bhindar	1086.31	906.15	38.4235	3.8424	34.5811	35.7984	3.0821	38.8805	9.2689	0.0000	112.43	YES	NO	OVER EXPLOITED
237	Udaipur	Girwa	1402.80	1007.80	45.9381	4.5939	41.3442	31.7718	7.5198	39.2916	11.9280	0.0000	95.04	YES	NO	SEMICRITICAL
238	Udaipur	Gogunda	1077.56	712.63	27.9045	2.7905	25.1140	22.6206	1.4998	24.1204	5.1101	0.7734	96.04	YES	NO	SEMICRITICAL
239	Udaipur	Jhadol	1469.74	756.43	23.1444	2.0616	21.0828	18.2946	2.0969	20.3915	6.1743	0.3645	96.72	YES	NO	SEMICRITICAL

S.No.	District	Block	Area of Block	Potential Zone area	Total Annual Ground Water Recharge	Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Development	Whether significant decline in Pre-monsoon Water Level	Whether significant decline in Post-monsoon Water Level	Category of Block
			(Sq.km.)	(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)	(Yes/No)	(Yes/No)	
240	Udaipur	Kherwara	1088.57	792.30	29.3592	4.4039	24.9553	19.8504	3.2806	23.1310	8.9827	1.4606	92.69	YES	NO	SEMICRITICAL
241	Udaipur	Kotra	1761.12	627.80	22.4803	2.2480	20.2323	15.0384	1.4579	16.4963	4.8252	0.4789	81.53	NO	NO	SAFE
242	Udaipur	Lasadiya	493.75	348.14	11.3418	1.1342	10.2076	8.9820	1.0553	10.0373	2.4823	0.0000	98.33	YES	NO	SEMICRITICAL
243	Udaipur	Mavli	808.58	783.57	28.0000	1.8021	26.1979	31.3208	3.4974	34.8182	8.7830	0.0000	132.90	YES	NO	OVER EXPLOITED
244	Udaipur	Salumbar	1023.00	744.63	45.7353	5.8269	39.9084	25.7115	3.0851	28.7966	7.9608	6.2361	72.16	YES	NO	SEMICRITICAL
245	Udaipur	Sarada	1082.73	828.63	35.7970	7.4239	28.3731	20.9694	2.4959	23.4653	8.3950	0.0098	82.70	YES	NO	SEMICRITICAL
			335076.73	220603.74	12513.3370	1256.5672	11256.7695	13786.5253	1919.4723	15705.9976	2315.1773	903.1139	139.52			OVER EXPLOITED

BLOCKWISE GROUND WATER RESOURCES OF RAJASTHAN AS ON 31-03-2013 (SALINE GROUND WATER)

Appendix III

S.No.	District	Block	Saline Zone area	Total Annual Ground Water Recharge	Natural Discharge during non- monsoon season	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross G.W. Draft for Dom. & Ind. Use	Existing Gross Ground Water Draft for all uses	Allocation for Dom. & Ind. Requirement	Net G.W. availability for future irrigation Dev.	Stage of G.W. Developme nt
			(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)
1	Alwar	Kathumar	200.89	28.2807	2.8281	25.4526	15.5525	0.9198	16.4723	0.0000	9.9001	64.7176
2	Alwar	Laxmangarh	175.51	19.5593	1.9559	17.6034	7.6860	0.1896	7.8756	0.0000	9.9174	44.7391
3	Barmer	Baetu	2751.47	37.4646	3.7465	33.7181	0.3440	1.3059	1.6499	0.2510	33.1231	4.8932
4	Barmer	Balotra	2619.15	61.9999	6.2000	55.7999	1.4496	1.3141	2.7637	0.4494	53.9009	4.9529
5	Barmer	Barmer	1824.95	23.5080	2.3508	21.1572	0.0704	0.8619	0.9323	0.5138	20.5730	4.4065
6	Barmer	Chohtan	1129.08	26.6106	1.3305	25.2801	4.3128	0.9618	5.2746	0.5375	20.4298	20.8646
7	Barmer	Dhorimanna	543.26	12.7663	1.2766	11.4897	1.2232	0.4866	1.7098	0.4351	9.8314	14.8812
8	Barmer	Sheo	3979.06	25.6186	2.5619	23.0567	0.2760	1.8699	2.1459	1.1622	21.6185	9.3071
9	Barmer	Sindhari	2037.60	46.1865	3.4624	42.7241	1.6410	1.6992	3.3402	0.3967	40.6864	7.8181
10	Barmer	Siwana	556.52	22.5548	2.2555	20.2993	3.6832	0.2340	3.9172	0.0711	16.5450	19.2972
11	Bharatpur	Deeg	131.91	17.8913	1.7891	16.1022	14.9976	1.0501	16.0477	0.0000	1.1046	99.6615
12	Bharatpur	Kumher	335.12	38.3149	3.8315	34.4834	20.9856	1.4447	22.4303	0.0000	13.4978	65.0467
13	Bharatpur	Nadbai	165.36	22.1201	2.2120	19.9081	20.2368	1.1435	21.3803	0.0000	0.0000	107.3950
14	Bharatpur	Nagar Pahari	319.68	46.1168	2.3058	43.8110	11.4204	1.3344	12.7548	0.0000	32.3906	29.1132
15	Bharatpur	Sewar	228.27	28.9847	2.8985	26.0862	11.3472	2.0122	13.3594	0.0000	14.7390	51.2125
16	Bharatpur	Weir	158.66	25.9820	2.5982	23.3838	35.4911	0.0000	35.4911	0.0000	0.0000	151.7764
17	Bikaner	Bikaner	633.76	11.1553	0.5578	10.5975	0.0000	0.0000	0.0000	0.0000	10.4175	0.0000
18	Bikaner	Dungargarh	300.02	5.7964	0.2898	5.5066	0.0000	0.0000	0.0000	0.0000	5.5066	0.0000
19	Bikaner	Khajuwala	5453.24	110.5184	5.5259	104.9925	0.0000	0.0000	0.0000		104.9925	0.0000
20	Bikaner	Kolayat	6046.86	99.4497	4.9725	94.4772	0.0000	0.0000	0.0000	0.0000	94.4772	0.0000
21	Bikaner	Lunkaransar	4257.02	76.1115	3.8056	72.3059	0.1512	0.0000	0.1512	0.0000	72.1547	0.2091
22	Bikaner	Nokha	88.34	1.7706	0.0885	1.6821	0.0000	0.0000	0.0000	0.0000	1.6821	0.0000
23	Churu	Churu	1122.49	22.8995	1.1450	21.7545	0.0000	0.0000	0.0000	0.0000	21.7545	0.0000
24	Churu	Rajgarh	1900.67	50.8542	2.5427	48.3115	0.0000	0.0000	0.0000	0.0000	48.3115	0.0000
25	Churu	Ratangarh	577.11	11.4920	0.5746	10.9174	0.0000	0.0000	0.0000	0.0000	10.9174	0.0000
26	Churu	Sardarshahar	1737.04	42.2313	2.1116	40.1197	0.0000	0.0000	0.0000		40.1197	0.0000
27	Churu	Sujargarh	1453.50	12.5596	0.6280	11.9316	0.0000	0.0000	0.0000	0.0000	11.9316	0.0000
28	Churu	Taranagar	1810.40	47.0090	2.3505	44.6585	0.0000	0.0000	0.0000	0.0000	44.6585	0.0000
29	Ganganagar	Anupgarh	1871.68	179.8534	17.9853	161.8681	2.0250	0.0560	2.0810	0.1400	159.7031	1.2856
30	Ganganagar	Ganganagar	624.30	139.1829	13.9183	125.2646	38.7162	0.0420	38.7582	0.1050	86.4434	30.9411
31	Ganganagar	Gharsana	1262.32	87.2651	8.7265	78.5386	1.1340	0.0280	1.1620	0.0700	77.3346	1.4795

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			(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)
32	Ganganagar	Karanpur	577.10	86.1519	8.6152	77.5367	13.4370	0.0770	13.5140	0.1925	63.9072	17.4292
33	Ganganagar	Padampur	700.50	77.9429	7.7943	70.1486	12.2418	0.0490	12.2908	0.1225	57.7843	17.5211
34	Ganganagar	Raisinghnagar	1272.00	152.4505	15.2451	137.2054	6.0444	0.0910	6.1354	0.2275	130.9335	4.4717
35	Ganganagar	Sadulshahar	861.20	106.4290	10.6429	95.7861	8.3088	0.0560	8.3648	0.1400	87.3373	8.7328
36	Ganganagar	Suratgarh	2888.90	210.5328	11.7834	198.7494	13.2030	0.0560	13.2590	0.1400	185.4064	6.6712
37	Hanumangarh	Bhadra	1618.70	93.0327	7.1062	85.9265	16.1352	1.7500	17.8852	2.6250	67.1663	20.8145
38	Hanumangarh	Hanumangarh	867.17	139.7909	13.9791	125.8118	39.9294	0.0560	39.9854	0.0840	85.7984	31.7819
39	Hanumangarh	Nohar	2382.35	113.8169	11.3817	102.4352	19.7694	0.0770	19.8464	0.1155	82.5503	19.3746
40	Hanumangarh	Pilibanga	735.78	105.8760	10.5876	95.2884	33.8958	0.0420	33.9378	0.0630	61.3296	35.6159
41	Hanumangarh	Rawatsar	1672.25	119.1652	11.9165	107.2487	28.1547	0.0840	28.2387	0.1260	78.9680	26.3301
42	Hanumangarh	Sangaria	512.43	73.5823	7.3582	66.2241	24.2649	0.0560	24.3209	0.0840	41.8752	36.7251
43	Hanumangarh	Tibi	512.42	70.4694	7.0469	63.4225	24.1119	0.0630	24.1749	0.0945	39.2161	38.1172
44	Jaipur	Phagi	340.06	26.1098	2.6110	23.4988	23.9600	0.0000	23.9600	0.0000	0.0000	101.9627
45	Jaisalmer	Jaisalmer	8994.78	88.9939	8.8993	80.0946	0.0000	0.3660	0.3660	0.1754	79.9192	0.4570
46	Jaisalmer	Sam	13150.35	49.4240	4.9425	44.4815	1.4775	0.7200	2.1975	0.2619	42.7421	4.9403
47	Jaisalmer	Sankra	3909.83	38.2223	3.8223	34.4000	0.9125	0.4174	1.3299	8.0858	25.4017	3.8660
48	Jalor	Ahore	1006.00	50.5693	5.0569	45.5124	6.6456	0.9120	7.5576	1.0800	37.7868	16.6056
49	Jalor	Bhinmal	35.62	1.7235	0.1723	1.5512	0.0850	0.0000	0.0850	0.0000	1.4662	5.4796
50	Jalor	Chitalwana	742.25	37.3993	3.7399	33.6594	22.6440	0.2160	22.8600	0.2160	20.1865	67.9156
51	Jalor	Jalore	147.56	7.6989	0.7699	6.9290	0.7776	0.0000	0.7776	0.0000	6.1514	11.2224
52	Jalor	Sayla	92.00	4.0423	0.4042	3.6381	1.2468	0.0000	1.2468	0.0000	2.3913	34.2706
53	Jhunjhunun	Alsisar	119.78	4.9378	0.4938	4.4440	1.1808	0.4730	1.6538	0.0000	3.2632	37.2142
54	Jodhpur	Balesar	375.22	8.6995	0.8699	7.8296	0.1900	0.0352	0.2252	0.3600	7.2796	2.8763
55	Jodhpur	Bap	793.11	12.5418	1.2542	11.2876	1.6800	0.1500	1.8300	0.7500	8.8576	16.2125
56	Jodhpur	Bhopalgarh	37.00	0.7188	0.0719	0.6469	0.1190	0.0480	0.1670	0.1080	0.4199	25.8154
57	Jodhpur	Bilara	260.13	13.2517	1.3252	11.9265	4.4940	0.0480	4.5420	0.1000	7.3325	38.0833
58	Jodhpur	Luni	1220.17	44.7411	4.4741	40.2670	0.8256	0.0720	0.8976	0.1800	39.2614	2.2291
59	Jodhpur	Mandor	90.77	1.2807	0.0640	1.2167	0.6422	0.0840	0.7262	0.0600	0.5145	59.6860
60	Jodhpur	Shergarh	545.40	18.3816	1.8382	16.5434	4.6464	0.3900	5.0364	0.2500	11.6470	30.4436
61	Nagaur	Degana	260.00	7.3450	0.7345	6.6105	1.3750	1.2160	2.5910	1.1498	4.0857	39.1952
62	Nagaur	Jayal	223.50	4.6314	0.4631	4.1683	0.0960	0.3200	0.4160	0.8986	3.1737	9.9801
63	Nagaur	Kuchaman city	381.25	22.5694	2.2569	20.3125	5.2360	2.1840	7.4200	1.7647	13.3118	36.5292

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			(Sq.km.)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(%)
64	Nagaur	Ladnu	81.25	2.0162	0.2016	1.8146	0.1825	0.7040	0.8865	0.4423	1.1898	48.8537
65	Nagaur	Makrana	75.00	3.3268	0.3327	2.9941	0.9570	1.0080	1.9650	1.1000	0.9371	65.6291
66	Nagaur	Merta	56.25	3.0631	0.3063	2.7568	0.0000	0.5760	0.5760	1.0000	1.7568	20.8938
67	Nagaur	Nagaur	262.50	9.2031	0.9203	8.2828	0.4620	0.8960	1.3580	0.8000	7.0208	16.3954
68	Pali	Jaitaran	33.62	1.7602	0.1760	1.5842	1.7395	0.2326	1.9721	0.2326	0.0000	124.4855
69	Pali	Marwar Junction	102.88	2.7521	0.2752	2.4769	3.1128	0.2910	3.4038	0.2910	0.0000	137.4218
70	Pali	Pali	970.48	48.3031	4.8302	43.4729	18.0075	0.0627	18.0702	0.5350	24.9686	41.5666
71	Pali	Rani	113.89	5.8339	0.5834	5.2505	3.1150	0.1530	3.2680	0.0000	2.1355	62.2417
72	Pali	Rohat	1271.65	47.5885	4.4944	43.0941	6.1670	0.1090	6.2760	0.2000	36.7271	14.5635
73	Pali	Sojat	411.85	15.4766	1.5476	13.9290	3.4930	0.4135	3.9065	0.1600	10.2760	28.0458
74	Pali	Sumerpur	284.48	15.0449	1.5045	13.5404	2.8068	0.6963	3.5031	0.5000	10.2336	25.8715
75	Sikar	Fatehpur	32.49	1.2282	0.1228	1.1054	0.4339	0.0000	0.4339	0.0000	0.6715	39.2528
76	Sikar	Lachhmangarh	43.32	2.0873	0.2087	1.8786	0.8880	0.0000	0.8880	0.0000	0.9906	47.2692
77	Sikar	Piprali	17.65	0.8454	0.0845	0.7609	0.4541	0.0000	0.4541	0.0000	0.3068	59.6793
78	Tonk	Malpura	81.00	3.9412	0.3941	3.5471	2.5890	0.0000	2.5890	0.0000	0.9581	72.9892
79	Tonk	Tonk	214.00	9.7844	0.9784	8.8060	5.6640	0.0000	5.6640	0.0000	3.1420	64.3198
	Total		97673.13	3346.8856	293.5078	3053.3778	560.5462	32.2044	592.7506	28.8474	2487.4415	19.4129

