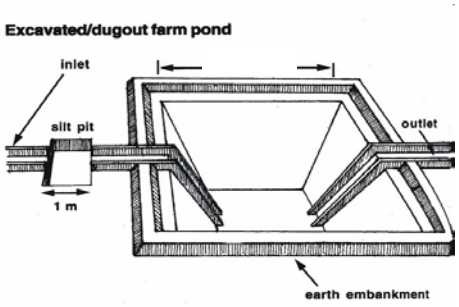
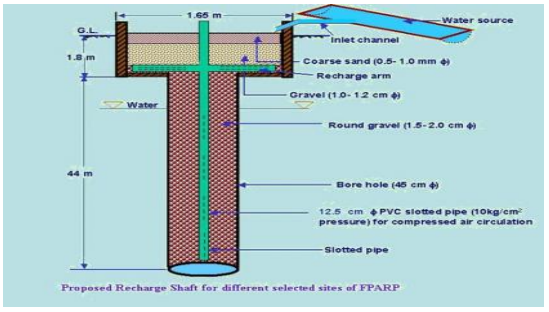
CENTRAL GROUND WATER BOARD

MINISTRY OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVANATION
GOVERNMENT OF INDIA





ARTIFICIAL RECHARGE TO GROUND WATER AND WATER CONSERVATION PLAN OF MASUDA BLOCK, DISTRICT AJMER, RAJASTHAN

Western Region, Jaipur
January, 2016

ARTIFICIAL RECHARGE TO GROUND WATER AND WATER CONSERVATION PLAN OF MASUDA BLOCK, DISTRICT AJMER

Plan at a Glance

1.	**Area of the Masuda Block**	**891.99 sq.km.**
2.	**Area identified for Artificial Recharge**	**817.00 sq km**
3.	**Dynamic Ground Water Resources (as on 31.03.2011)**	
	Net Ground Water Availability	**31.9959 MCM**
	Annual Ground Water Draft	**36.3532 MCM**
	Stage of Ground Water Development	**113.62%**
4.	**Volume of water to be harnessed** **Volume of water available for recharge** **Volume of water available for conservation by other interventions**	**0.0431 MCM** **0.0431 MCM** **-**
5.	**Volume of unsaturated aquifer zone available for recharge**	**165.443 MCM**
6.	**Total number of structures to be proposed**	
	Recharge structures Existing village pond with recharge shaft/ well	**Numbers** **1 shafts in 1 Nos. of existing village ponds**
	Expected Annual GW recharge	**0.0302 MCM**
	Provision for supplemental irrigation, thus reducing GW withdrawal for irrigation	**-**
	Total recharge/ saving of ground water	**0.0302 MCM**
7.	**Estimated Cost** **Artificial Recharge Plan** **Water conservation measures** **Piezometer construction** **Operation and maintenance**	**0.0336 crore** **0.026 crore** **-** **0.006 crore** **0.0016 crore**

ARTIFICIAL RECHARGE TO GROUND WATER AND WATER CONSERVATION PLAN OF MASUDA BLOCK, DISTRICT AJMER

INTRODUCTION

The demand of fresh water for agriculture, drinking and industrial uses etc. has significantly increased due to population growth and socio-economic development. As surface water resources in the State of Rajasthan are meagre, the dependability on ground water resources in the State has increased substantially. This has resulted in over exploitation of ground water resources vis a vis depletion of ground water levels in various parts of the State.

The **Masuda Block, district Ajmer** is one of the over exploited blocks of Rajasthan and is under severe stress, as evident from the stage of ground water development, which has attained an alarming level of **113.62%.** In view of over exploitation of ground water resources in the block, ground water resources in the area are under continuous depletion. Thus there is urgent need for taking up suitable water management interventions based on integrated approach, which on one hand includes augmentation of ground water resources through appropriate techniques, and on the other hand requires the adoption of suitable water conservation measures, such as ensuring water use efficiency through creation of additional water storage facility, maintenance/ renovation of existing water bodies etc. Water awareness and capacity building of the stakeholders are also the important attributes of water management interventions as envisaged in the National Water Policy.

Artificial recharge to ground water is one of the most efficient, scientifically proven and cost effective technology to mitigate the problems of over exploitation of ground water resources. The technology serves as a means for restoring the depleted ground water storage, ameliorate the ground water quality problems and also enhance the sustainability of wells in the affected areas. A detailed knowledge of geology, hydrogeology, land use pattern, geomorphology and hydro-meteorological features are however, essential for selection of appropriate artificial recharge techniques as well as design and sites of ground water recharge structures.

As per directions of Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India and in pursuance to letter no 16-24/M(SML)/CGWB/ARP- OE Blocks/2015-6957, dated 13.7.2015 & 3.8.2015 & letter no 39(43)/TC/CHN/CGWB/2015-7929,dated 4.9.2015 from Central Headquarters, Central Ground Water Board, **the preparation of Artificial Recharge and Rainwater harvesting Plan for the Over exploited blocks in the State of Rajasthan has been taken up** on priority by the Western Region, Central Ground Water Board, Jaipur. Each Plan discusses the broad framework of ground water situation in the block, status of water availability (both surface and ground water), identification of feasible areas for interventions, feasibility of Artificial recharge and other water conservation structures,

their design considerations, numbers and cost estimates. The expected outcomes of the proposed interventions have also been elucidated in the report

The GIS layers used in the Plan include administrative (upto village level), Hydrogeology, Depth to Water level (pre and post monsoon), geomorphic, drainage, water bodies and the map of tentative locations of proposed interventions.

Methodology:

The methodology as adopted for the assessment of source water availability is as follows:
As per Ground Water Department, Government of Rajasthan direction the basin wise availability of surplus run off is calculated after taking into account 75 % dependability on the rain water for all uses. In furtherance, the sub basins with surplus run off available for recharge were taken into consideration.
The block area falling in particular sub basin was taken into account and a proportionate area of the sub-basin draining the block was calculated. Based on this area of sub-basin draining the block, proportionate surplus run off, in the block by the sub basin, for recharge was calculated.
Thus was calculated the final amount of surplus run off available for recharge in particular block by one particular sub-basin. The available run off was considered for Recharge through Recharge Shaft (@ 0.03 MCM) and Percolation tank (@ 0.2 MCM). If after allocating water for Recharge through Recharge Shaft, large amount of surface run off was left then the Water conservation through Farm Ponds, along with recharge through Percolation Tanks, was also taken into account.
Besides the available run off the Average Water Level for the time span of ten years (Nov., 2005 to Nov. 2014) and the Decadal Water Level trend (Nov., 2005 to Nov. 2014) were also taken into account. The block showing average water level more than 5 m bgl and declining water level trend were considered as suitable for Artificial Recharge Plan.

Location of the block

The Masuda Block of Ajmer District, covering an area of 891.99 Sq. Km. falls in the central-southern part of Ajmer District and is located between North latitudes 25°51’ & 26°14’ and East longitudes 74°21’ & 74°43’. As per 2011 census, the total population of the Block is 185713 persons consisting of 95202 males & 90511 females. Location map is shown in fig 1.

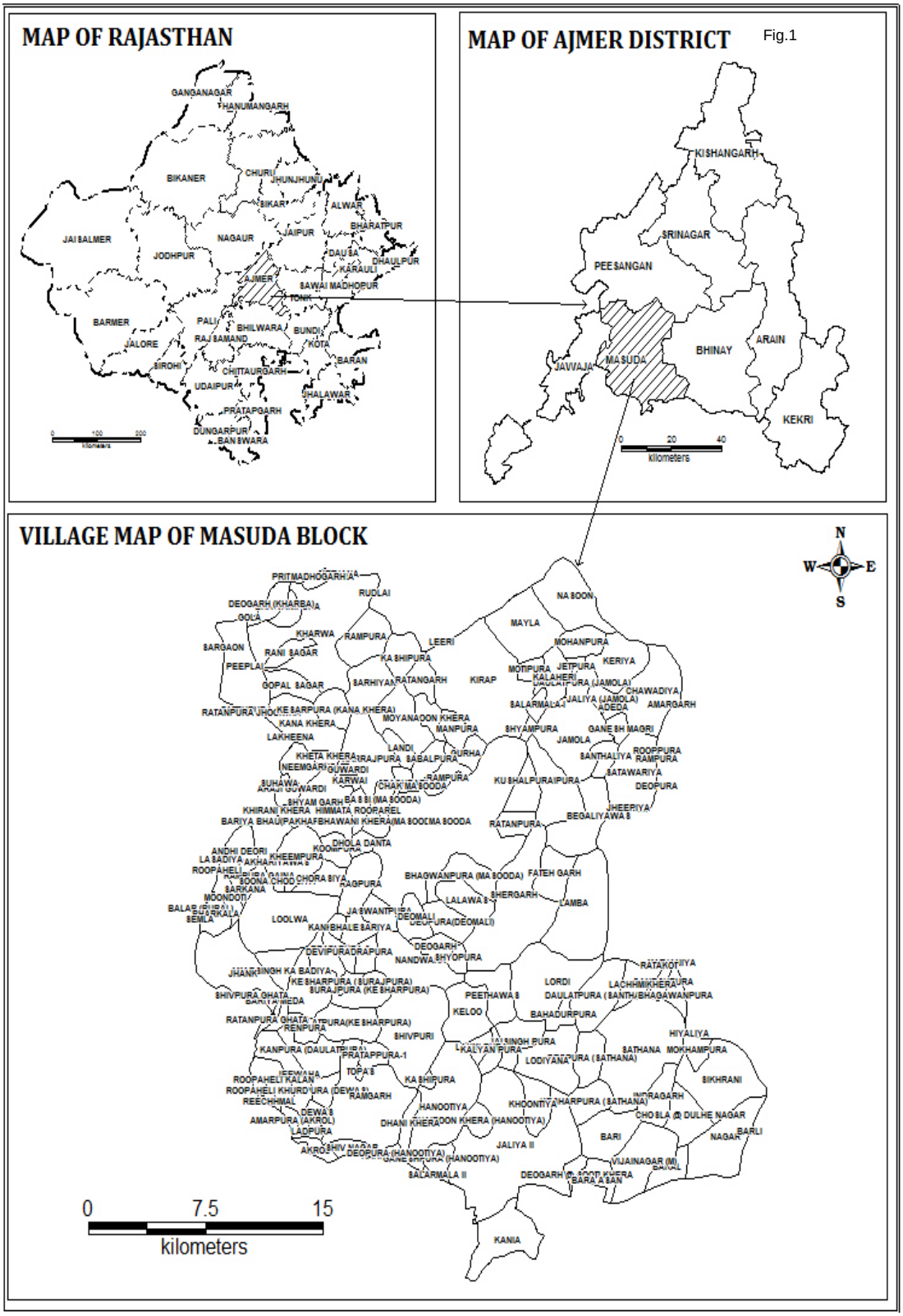

MAP OF RAJASTHAN
GANGANAGAR
HANUMANGARH
BIKANER
CHURU
JHUNJHUNU
SIKAR
ALWAR
BHARATPUR
JAISALMER
NAGAUR
JAIPUR
DAUSA
DHAULPUR
JODHPUR
KARAULI
AJMER
SAWAI MADHOPUR
TONK
BARMER
PALI
BHILWARA
BUNDI
JALORE
RAJSAMAND
KOTA
SIROHI
CHITTAURGARH
BARAN
UDAIPUR
JHALAWAR
PRATAPGARH
DUNGARPUR
BANSWARA
0 100 200
kilometers
MAP OF AJMER DISTRICT
KISHANGARH
SRINAGAR
PEESANGAN
BHINAY
ARAIN
JAWAJA
MASUDA
KEKRI
0 20 40
kilometers
VILLAGE MAP OF MASUDA BLOCK
N
W
E
S
PRITMADHOGARH A
RUDLAI
NASOON
DEOGARH (KHARBA) A
GOLA
MAYLA
KHARWA
RAMPURA
LEERI
MOHANPURA
BARGAON
RANI SAGAR
KA SHIPURA
KERIYA
PEEPLAI
MOTIPURA
JETPURA
KALAHERI
GOPAL SAGAR
SARHIYA
RATANGARH
KIRAP
CHAWADIYA
SALARMALA I
JALIYA (JAMOLA)
ADEDA
AMARGARH
RATANPURA JHOK
KE SARPURA (KANA KHERA)
MOYANA OON KHERA
KANA KHERA
MANPURA
SHYAMPURA
GANE SH MAGRI
LAKHEENA
JAMOLA
LANDI
KHETA KHERA
SAGALPURA
GURHA
SANTHALIYA
ROOPPURA RAMPURA
NEEMGARI
GUWARDI
SATAWARIYA
SUHAWA
KARWAI
RAMPURA
KUSHALPURA IPURA
DEOPURA
SHYAM GARH
BA S SI (MA SOODA)
KHIRANI KHERA
HIMMATA ROOPAREL
JHEERIYA
BARIYA BHAU (PAKHA F BHAWANI KHERA (MA SOOD MA SOODA
RATANPURA
BEGALIYA WAS
DHOLA DANTA
ANDHI DEORI
KOOMPURA
LA SADIYA
KHEEMPURA
ROOPAHELI
SOONA CHOD CHORA SIYA
RAGPURA
BHAGWANPURA (MA SOODA)
FATEH GARH
SARKANA
MOONDOTI
SHERGARH
LAMBA
BALAR
SEMLA
LOOLWA
JA SWANTPURA
DEOMALI
LALAWAS
KANI BHALE SARIYA
DEOPURA (DEOMALI)
DEVIPURA DRAPURA
DEOGARH
NANDWA SHYOPURA
RATAKOTIYA
JHANI SINGH KA BADIYA
KE SHARPURA (SURAJPURA)
LORDI
LACHHMIKHERA URA
SHIVPURA GHATA
SURAJPURA (KE SHARPURA)
PEETHAWAS
DAULATPURA (SANTH/BHAGAWANPURA
RATANPURA GHATA
KELOO
BAHADURPURA
RENPURA
SHIVPURI
HIYALIYA
KANPURA (DAULATPURA)
PRATAPPURA-1
KALYAN PURA
SATHANA
MOKHAMPURA
LODIYANA PURA (SATHANA)
TOPA S
SIKHRANI
ROOPAHELI KALAN
KA SHIPURA
ROOPAHELI KHURD URA (DEWA S)
RAMGARH
RAGARH
REECHHMAL
HANOOTIYA
KHOONTIYA
HARPURA (SATHANA)
DEWA S
AMARPURA (AKROL)
DHANI KHERA OON KHERA (HANOOTIYA)
CHOSLA @ DULHE NAGAR
LADPURA
BARI
NAGAR
BARLI
AKROL SHIV NAGAR
DEOPURA (HANOOTIYA)
JALIYA II
VIJAINAGAR (M)
SALARMALA II
DEOGARH @ SANT KHERA
BARA A SAN
0 7.5 15
kilometers
KANIA

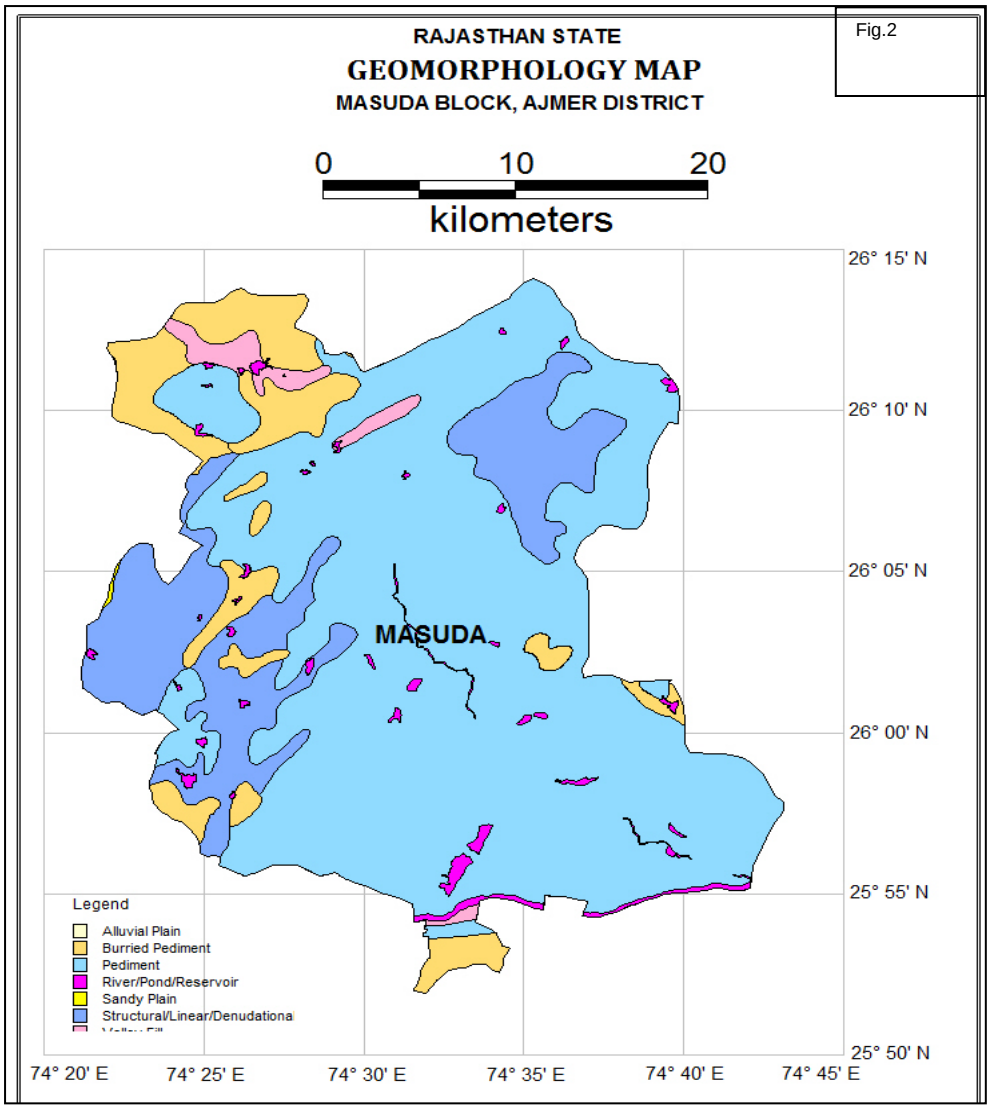
Fig.1

Source wise Irrigated Area

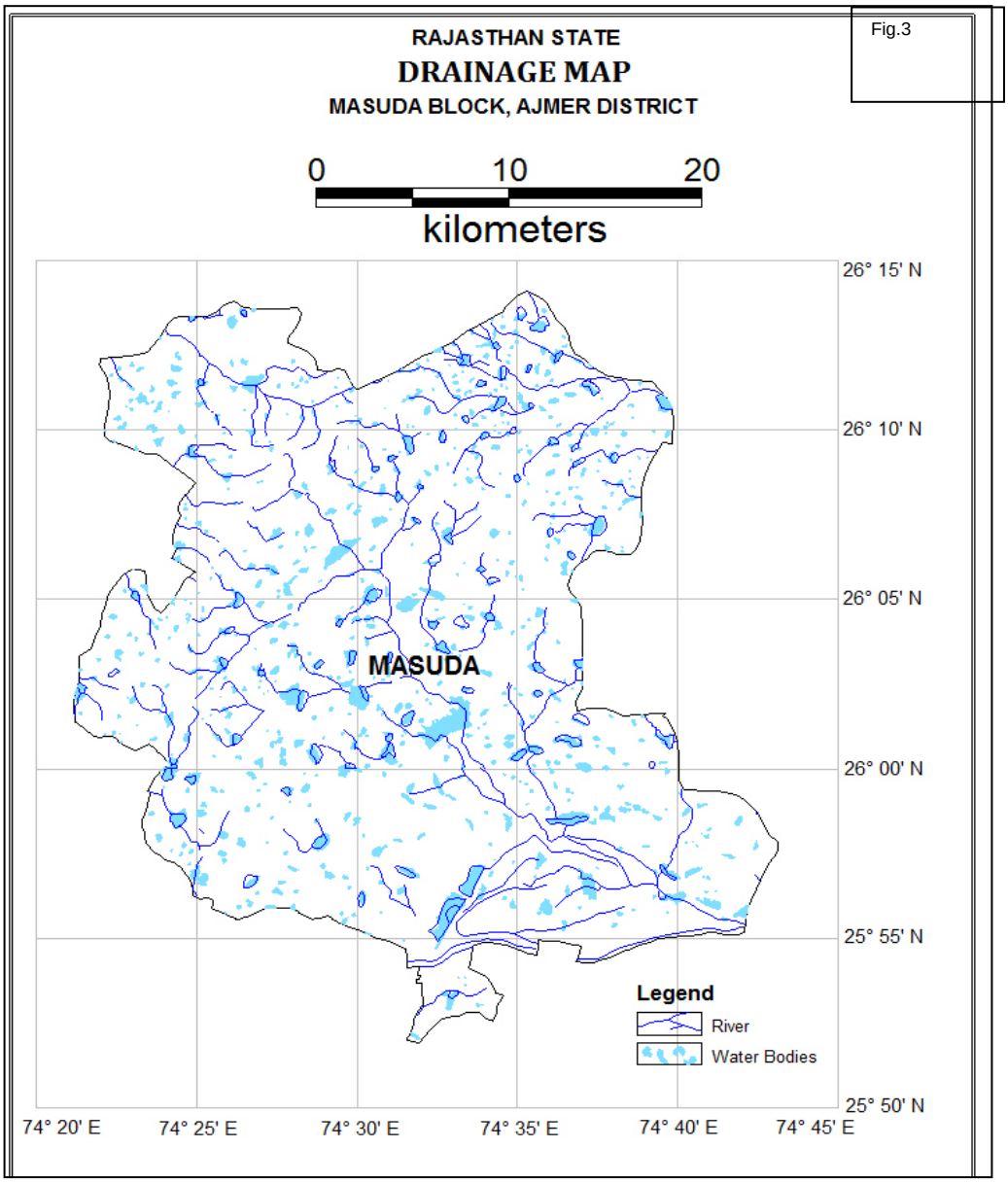
The dug wells/ Tube wells are the main source of irrigation in Masuda Block. There is very less area that falls under canal & pond irrigation.

Physiography & Drainage

Physiographically, the block is characterized by presence of pediments of denudation origin and hills. The minimum and maximum elevation of Block is 390.1 m amsl and 584.5 m amsl, respectively. The map showing various geomorphic units is presented in fig 2.



There is no perennial river flows in the Block. It is drained by ephemeral Bandi in South western part, Dhund in South Eastern part & Banganga in North Eastern part. The Central & Southern part comes under Banas river basin, North Eastern part comes under Banganga & Western part comes under Shekhawati (Mendha) basin. From south west to north east, the area falls under Luni river basin. The southern and eastern parts fall under Banas river basin. The map showing drainage and water bodies in the Masuda block are shown in fig 3.



Rainfall

The climate of the block is semi arid. The Normal annual rainfall of block is 465.63 mm (IMD, 1901-70). The available data of rainfall indicates that larger part of annual rainfall is received through SW monsoon during July to September.

Hydrogeology of the Area

The aquifer system of the block is represented by Gneiss of Bhilwara Supergroup and Schist of Delhi Supergroup. Out of total geographical area of 891.99 Sq. Km, an area of 817.00 Sq. Km. (91.59%) forms aquifer system (potential zone) in the block and remaining 74.99 Sq. Km.(8.41%) area is represented by hills. Gneiss and Schist form principal potential aquifer in the whole block. Ground water occurs under unconfined to semi-confined conditions in weathered and fractured part of the consolidated formation. In hard rock aquifers, groundwater occurrence is controlled by thickness of weathered zone, size, continuity and interconnectivity of fractured zones and other secondary porosities. These form poor aquifers as comparison to alluvium. Quality of water varies from potable to brackish. In general yield of wells tapping Gneiss varies from 0.35 to 1.04 lps & yield of wells tapping Schist ranges from 0.46 to 0.93 lps.

Ground Water Level:

As per Average decadal depth to water level (from November, 2005 to November, 2014), the block majorly falls in water level range 5-10 and 10-20 m bgl range. Patch in south-west shows range of 20-50 m bgl. (Fig 4)
The average decadal depth to water level is 14.99 mbgl for Pre monsoon & 5.99 mbgl for Post monsoon. According to depth to water level map of May 2014, water level ranges between 10 to 20 mbgl in major part, 20 to 40 mbgl in south western part and 5 to 10 mbgl in isolated patches. According to depth to water level map of November 2014, water level ranges between 5 to 10 mbgl in major part, 10 to 20 mbgl in north eastern part and 2 to 5 mbgl in some isolated patches. Depth to water level maps for May 2014 & November 2014 is shown in fig 5 & 6.

Water Level Trend:

The hydrographs of wells monitored by CGWB & GWD from 1997 to 2010 shows declining water level trend. A water level fall of 0.47 m/year during pre monsoon and 0.58 m/year during post monsoon has been observed for this period.
As per the Decadal Water level trend (from November, 2005 to November, 2014), the declining trend is visible in the block. The fall ranges from 1 to 2, 0 to 1, -1 to 0 and -2 to -1 as move from south-west to north-east. The map of Decadal Water Level Trend is shown in fig. 7.

Fig: 4

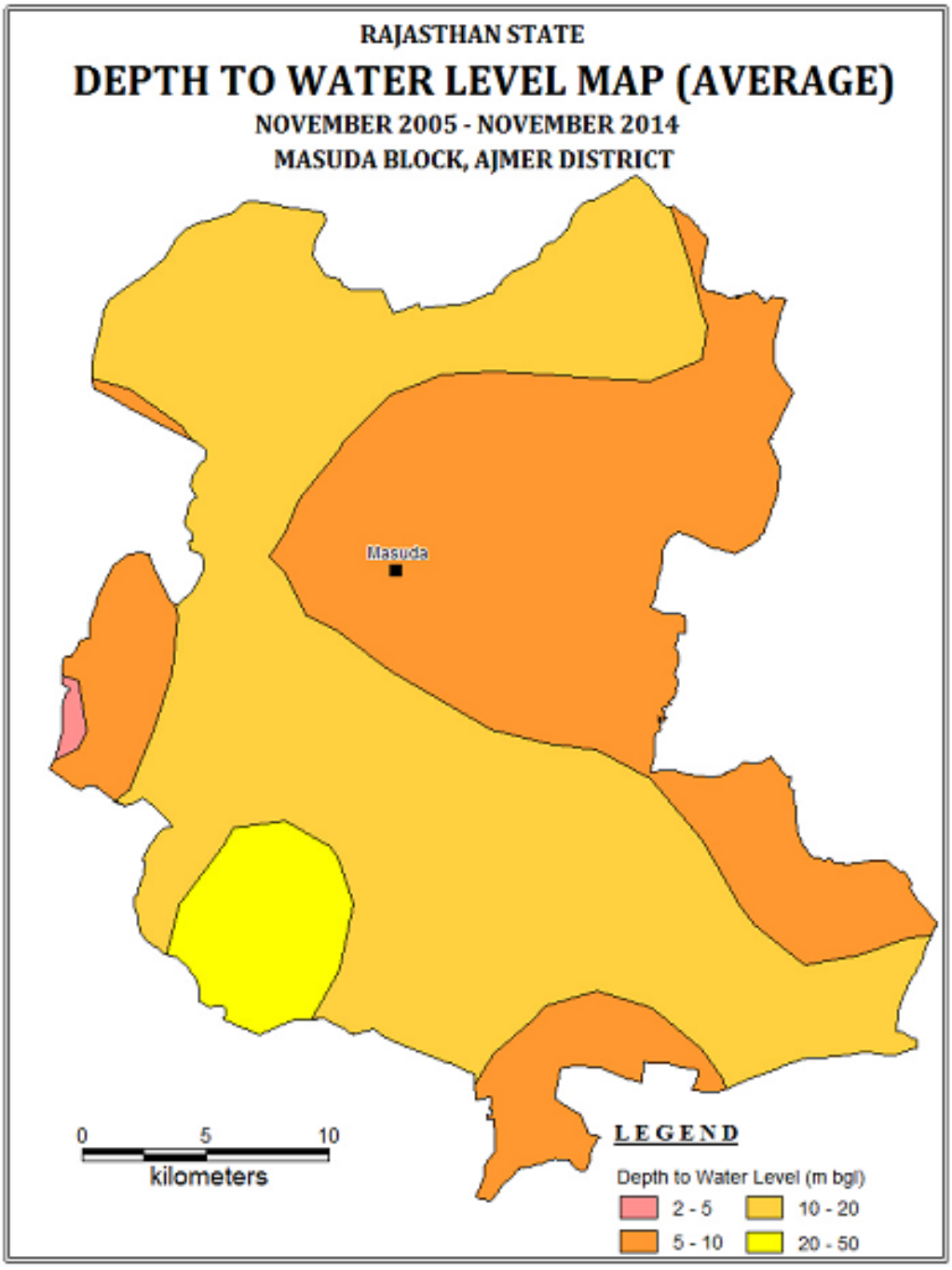

RAJASTHAN STATE
DEPTH TO WATER LEVEL MAP (AVERAGE)
NOVEMBER 2005 - NOVEMBER 2014
MASUDA BLOCK, AJMER DISTRICT
Masuda
0
5
10
kilometers
LEGEND
Depth to Water Level (m bgl)
2 - 5
10 - 20
5 - 10
20 - 50

Fig: 5

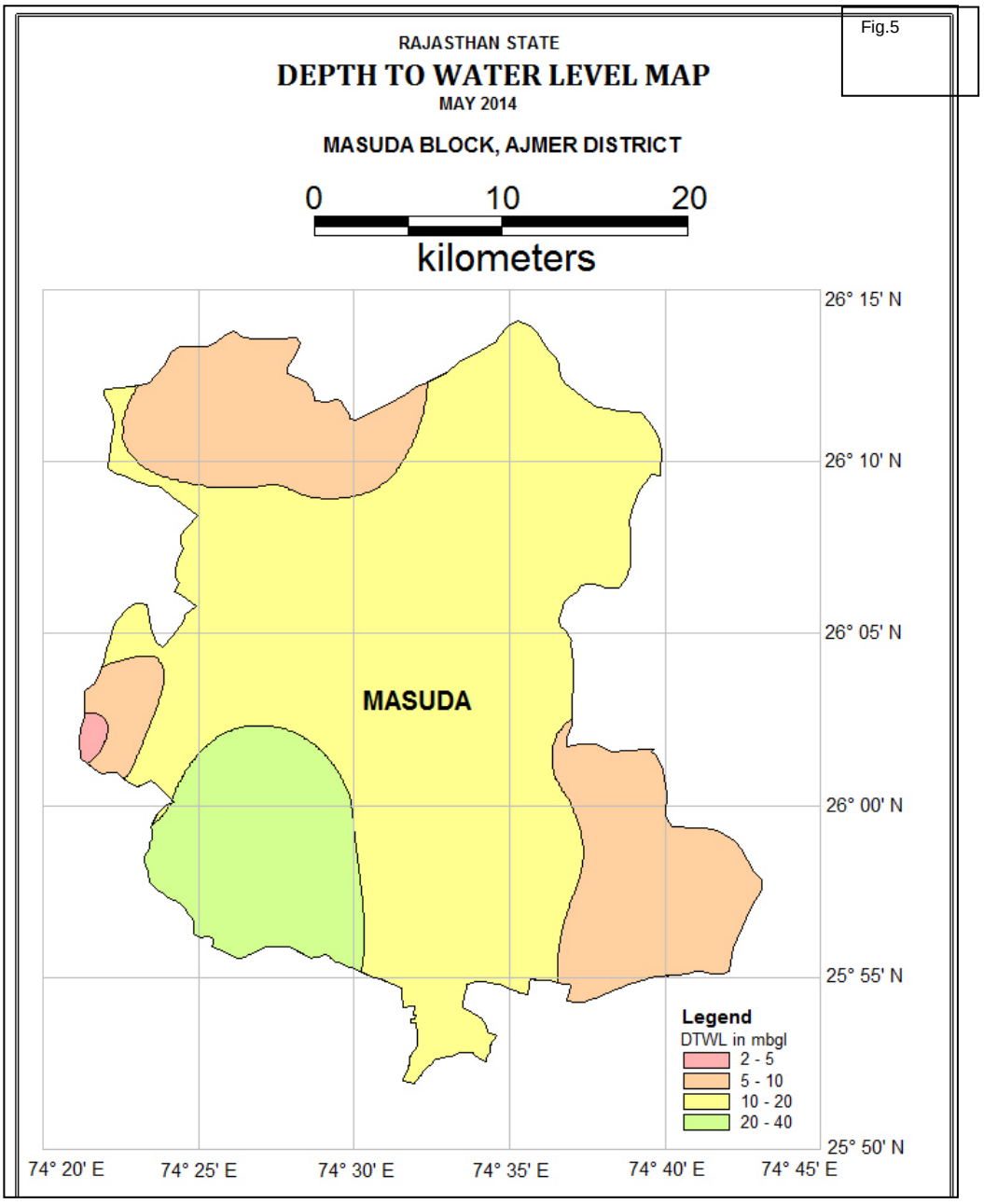


Fig.5
RAJASTHAN STATE
DEPTH TO WATER LEVEL MAP
MAY 2014
MASUDA BLOCK, AJMER DISTRICT
0
10
20
kilometers
26° 15' N
26° 10' N
26° 05' N
26° 00' N
25° 55' N
25° 50' N
MASUDA
Legend
DTWL in mbgl
2 - 5
5 - 10
10 - 20
20 - 40
74° 20' E
74° 25' E
74° 30' E
74° 35' E
74° 40' E
74° 45' E

Fig: 6

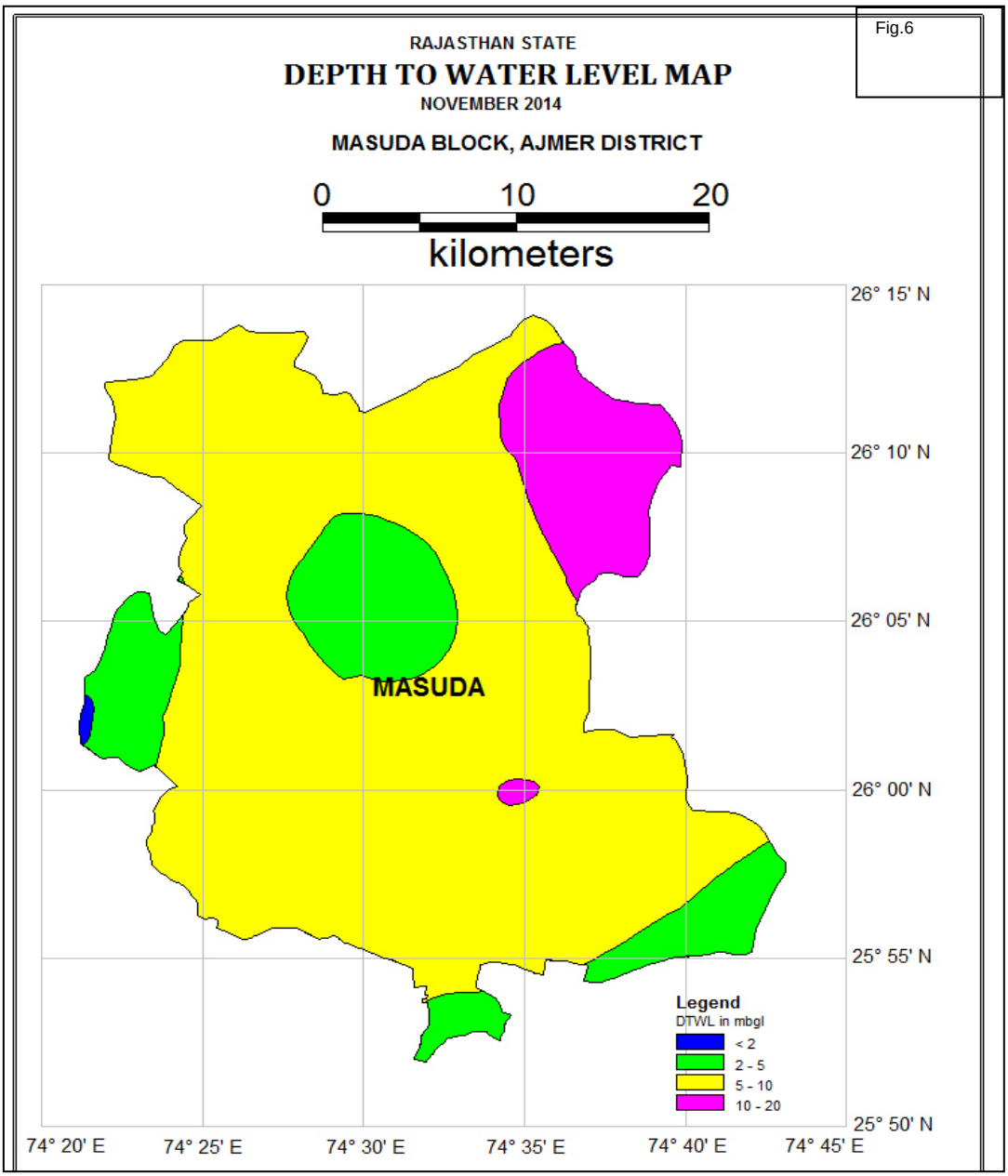
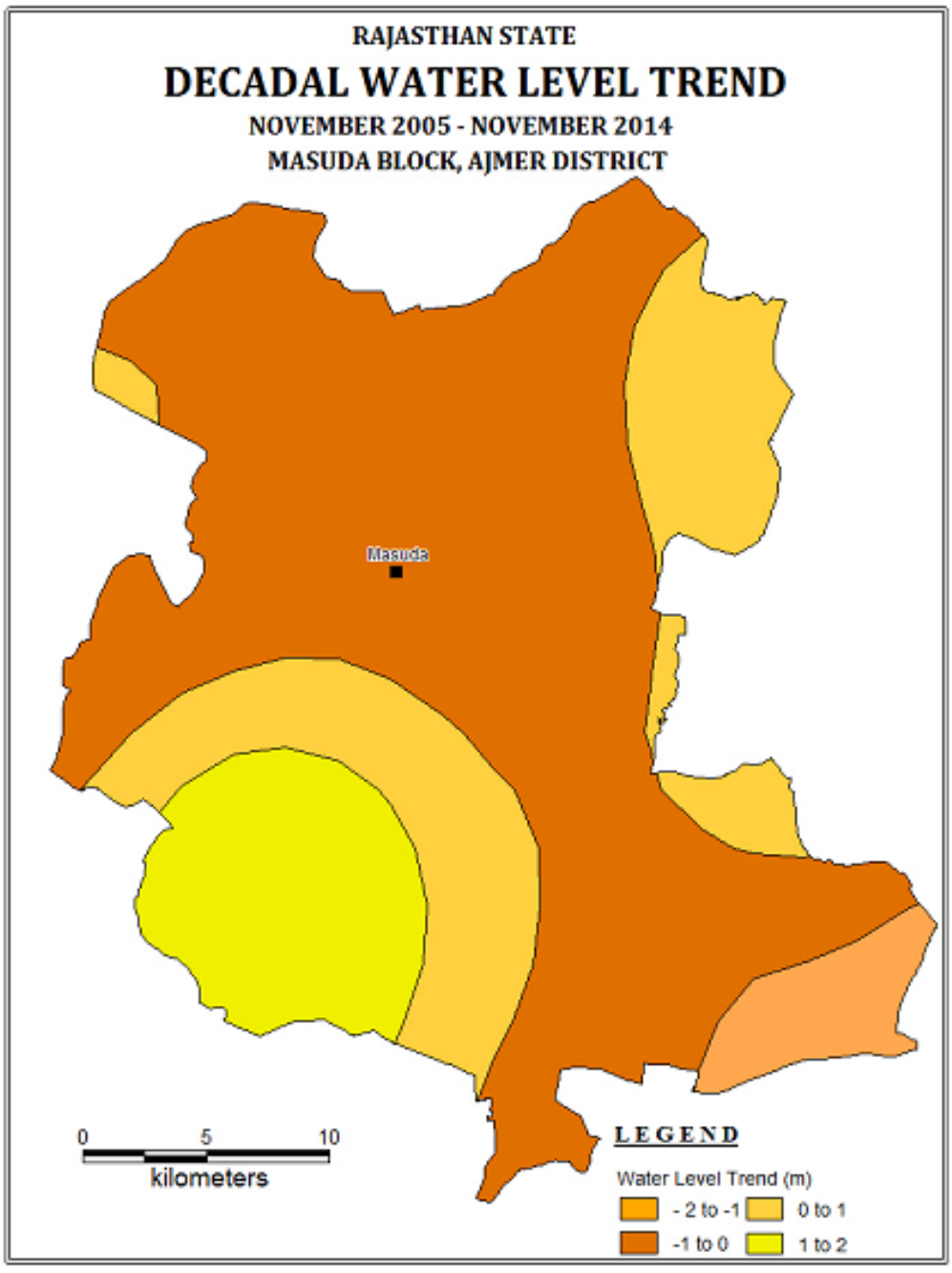


Fig.6
RAJASTHAN STATE
DEPTH TO WATER LEVEL MAP
NOVEMBER 2014
MASUDA BLOCK, AJMER DISTRICT
0
10
20
kilometers
26° 15' N
26° 10' N
26° 05' N
26° 00' N
25° 55' N
25° 50' N
MASUDA
Legend
DTWL in mbgl
< 2
2 - 5
5 - 10
10 - 20
74° 20' E
74° 25' E
74° 30' E
74° 35' E
74° 40' E
74° 45' E

Fig: 7


RAJASTHAN STATE
DECADAL WATER LEVEL TREND
NOVEMBER 2005 - NOVEMBER 2014
MASUDA BLOCK, AJMER DISTRICT
Masuda
0
5
10
kilometers
LEGEND
Water Level Trend (m)
- 2 to -1
0 to 1
-1 to 0
1 to 2

Subsurface Hydrogeology

As inferred from borehole data of the Masuda Block; Gneiss & Schist are the water bearing formations in this area. However, the ground water in these only occurs in shallow weathered parts or fractures due to absence of primary porosity. The depth of drilling ranges from 128.05 to 146.34 mbgl and the average discharge ranges from 1 to 2.67 lps. The area is affected by salinity & fluoride contamination.

Dynamic Ground Water Resource

The status of ground water resources of the block is presented in table 1. The annual Net Ground water Availability in the block is 3199.59ham and Annual Ground water draft is 3635.32ham. Stage of Ground water development has reached 113.62%.

Table 1: Ground Water Availability, Utilization and Stage of Development Masuda Block, Ajmer District (As on 31.3.2011)

Natural Discharge During Non Monsoon Period	355.51 ham
Net Annual Ground Water Availability	3199.59 ham
Annual Ground Water Draft	3635.32 ham
Net Ground water Availability for Future Irrigation Use	Nil
Stage of Ground Water Development	113.62%
Source: Ground Water Resource Assessment 31.03.2011	

Need for artificial recharge and water conservation plan

The present artificial recharge and water conservation Plan aims to mitigate the problems of continuous decline in water levels over the area through techniques of artificial recharge utilizing surplus rainwater based on scientific manner for optimal results. The broad scope of the recharge plan is as follows:

- Establishing efficacy of integrated approach through various artificial recharge and water conservation techniques. Intervention is proposed in cluster mode basis wherever feasible to have a better impact.
- Enhancing water use efficiency for controlling excessive ground water draft, especially for irrigation purposes.
- Ensuring sustainability of ground water abstraction structures and improvement in quality of ground water.

Surface water availability

As per the studies carried out by Water Resources Department, Govt of Rajasthan there is hardly any surplus water available for further development at 75% dependability. However, after taking into account the availability of source water in the basins of Rivers flowing in the State proportionate amount of surplus runoff available in particular block by particular sub basin was calculated.

Accordingly about 0.0431 MCM has been considered for recharge plan in the block. Optimum utilization of rainwater runoff depends on availability of land, feasible

conditions, etc. Surface water availability, allocation and number of structures are presented in table 2.

Table 2: Source water for artificial recharge and number of recharge structure

District	District code	Block	Block code	Area of Block (Sq.km.)	Potential area suitable for recharge (Sq.km.)	Type of Aquifer	Area feasible for artificial recharge (Sq km)	Sp Yield
AJMER	**RJ01**	**MASUDA**	RJ0106	891.990	817.000	hard rock	817.000	0.015

Table 2 (contd): Source water for artificial recharge and number of recharge structure

Average DTW (mbgl) NOV 2013	Thickness of unsaturated zone 3 m below ground level (m)	Volume of sub surface storage space available for artificial recharge (MCM)	Sub Basin	Surplus available in the block (in Mm3)	Surplus water used in Recharge Shaft (RS)	No. of RS 0.03 MCM/RS	Remaining Surplus water for Percolation tank (PT)	No. of PT (0.2 MCM/ PT)
16.500	13.500	165.443	Luni	0.0431	0.0431	1	0	0

Feasible Artificial Recharge and water conservation structures

A wide spectrum of techniques is in vougue, which are being implemented to recharge the ground water reservoir, conserve the utilizable rainfall and enhance the water use efficiency. Based on prevailing field conditions, out of total block area of 891.99sq km practically 817sq km area is feasible for implementing recharge measures. Based on available information about the area such as ground water scenario, hydrogeology, hydrology, topography, rainfall pattern, drainage, soil cover, utilizable rainfall etc. scope for various interventions has been studied and assessment of suitable areas, tentative design and costs of structures has been worked out in the present plan.

Identification of feasible areas

Masuda block is having ground water level between 5 & 10m below ground level and as per dynamic ground water resource estimation, the block is over exploited with stage of ground water development at 113.62%. The Masuda block is feasible for recharge due to presence of permeable zone above water table, favorable land slope and availability of water from rainfall.

Generally the Artificial recharge structures suitable in this type of area are Check dams/ Anicuts/ Percolation tanks and Recharge Shafts/ Recharge wells. Since the ground

water levels are quite deep in the block, the structures like ani-cuts and Check dams are not suitable and also their construction is regulated. Considering this aspect the proposal for Recharge Shaft/ Recharge wells and have been firmed up in the present Plan are the most suitable structures in Masuda block. In view of the availability of number of ponds in the block, percolation tanks are also not found feasible.

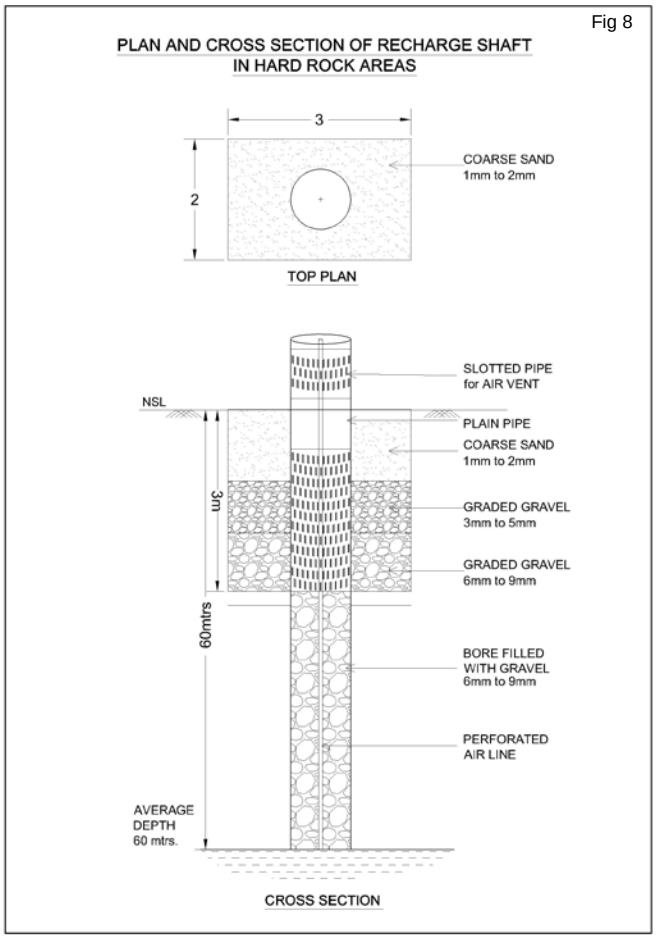
Details of Ground Water Recharge Measures

Existing Village Pond with recharge shaft/wells

Almost all the villages in the State of Rajasthan have one or two village ponds & other ponds. With time, these ponds get silted & hardly any water percolates downward. Also, any excess water coming into the pond goes away as a run off due to limited storage capacity. This surplus runoff can very well be utilized for recharging the ground water and also for enhancing conservation of water that can be further used for irrigation, thereby saving ground water withdrawal. Since natural recharge from these ponds is limited due to siltation and ground water levels are deep, the most effective ground water structure considered under the Plan is Recharge Shaft/ Recharge well constructed within the pond itself.

The above mentioned recharge well has been designed in a manner that maximum surplus water would likely to be utilized for recharge as well as sufficient water is retained in the pond for local use.

Fig 8



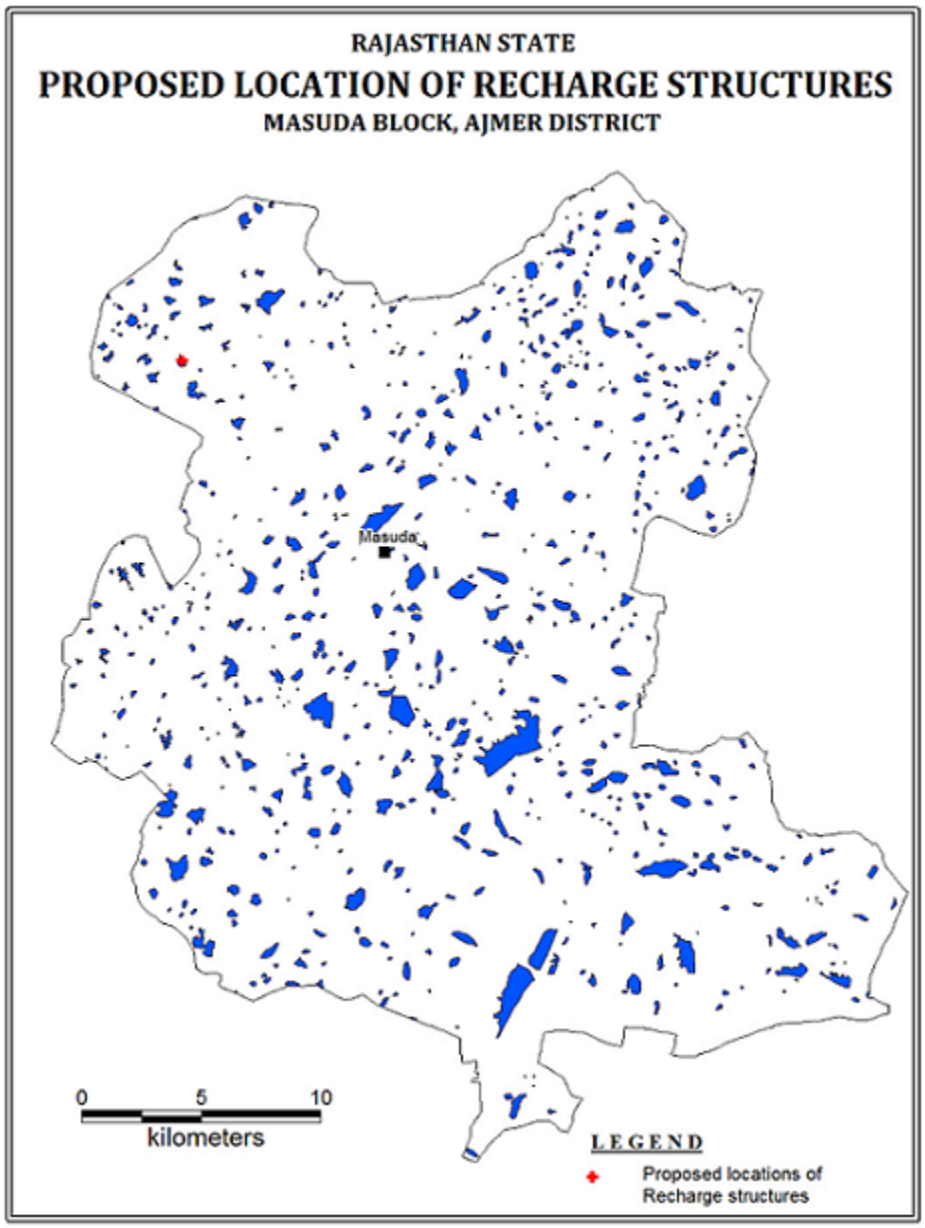
The model design of recharge well has been worked out in consultation with Ground Water Department, Government of Rajasthan and presented in Fig 6. The major features required are:

1. The well should have sufficient diameter for recharge- 10 to 12 inch diameter well with bottom screen/ opening just above the highest ground water level.
2. The well should have screen/ opening at the top, which should be at least 1.5m above the bed level of the pond.
3. The upper opening should be surrounded with filter pack comprising graded filter media of medium, coarse sand & gravel, so that the Recharge well does not get silted.

The opening for inflow to the well has been proposed at 1.5m above Bed level

of pond. This is necessary to ensure that the pond retains sufficient water for use by local consumers. However, this may necessitate further deepening of pond itself so that the pond is 3-4 m deep. A Single well as discussed above would be suitable for a pond upto area of about 5ha. Therefore, more number of such Recharge wells is envisaged for larger ponds.

Fig. 9



The tentative location of villages for construction of recharge shaft/well in existing village pond and their cost estimates are shown in Fig 9 and Table 3. The plan proposes construction of 1 recharge shafts/ wells in 1 identified existing village ponds at an estimated cost of 2.6 lacs. The block also has area with shallow water level (<5m), which is not recommended for artificial recharge.

Table 3: Tentative locations of village for village pond with recharge shaft

S No	Village	Long	Lat	Pond area (ha)	Formation	No of Shafts	Unit cost (Rs in lac)	Total cost (Rs in lac)
1	Rani Sagar	74.4058	26.1847	5.2808	Hard_rock	1	2.6	2.6
Total						1		2.6

B. Revival, repair of water bodies

The existing ponds and tanks in loose their storage capacity as well as the natural ground water recharge through these water bodies has also become negligible due to siltation and encroachment by farmers for agriculture purposes. There are several such villages where ponds/ tanks are in dilapidated condition. These existing village tanks, which are normally silted and damaged, can be modified to serve as recharge structure in case these are suitably located to serve as percolation tanks. Through desilting, coupled with providing proper waste weir, the village tanks can be converted into recharge structure.

Impact Assessment and Monitoring

Assessment of impact of the artificial recharge schemes implemented is essential to assess the efficacy of structures constructed. It helps in identification of cost-effective recharge mechanisms for optimal recharge into the ground water system. It also helps to make necessary modifications in site selection, design and construction of structures in future. The monitoring system should be designed judiciously to monitor impact of these structures individually as well as collectively. Demarcation of the zone of influence of the artificial recharge structure is one of the main objectives of monitoring.

It is proposed to utilize the existing data available with the Government of Rajasthan and CGWB baseline data. For assessment of the impact of proposed measures additional data will be generated by construction of the piezometer at suitable and strategic sites.

It is proposed to construct 01 piezometer, at suitable locations for monitoring of water level, in the vicinity of proposed recharge structure. The depth of the piezometer may

vary from 60 to 80 mbgl. This will help in assessing the impact of the project implementation.

Since the implantation of the Plan involves institutional framework, it is proposed to constitute State Level Technical Coordination Committee (SLTCC) and District Level Technical Coordination Committee (DLTCC) for proper monitoring and review of the implementation of the Plan.

Financial Outlay of the Plan

The total estimated cost of the Plan is 0.0336 cr, which includes Rs 0.026 cr for ground water recharge activities, Rs 0.006 for ground water monitoring (Piezometer construction) and Rs 0.0016 cr towards operation and maintenance charges. The tentative cost estimates of the various activities of the Plan are shown in Table 4 & 5. The unit rates are as followed by the Govt. of Rajasthan (BSR). The total estimated cost of the project is **Rs 0.0336 Crores**.

Table 4: Cost of the recharge structures

Cost of Percolation Tank in Rs in crs (Unit cost Rs 0.4 cr)	Cost Recharge Shaft Rs in crs (Unit cost Rs 0.05 cr for alluvium and Rs 0.026 cr for hard rock)
0	Hard rock – 0.026

Table 5: Tentative cost of different activities

Feasible Artificial Recharge & Water Conservation structures/ activities	Tentative Design	Quantity (in nos. or area in sq. m)	Rainwater harvested (mcm)	Tentative unit cost (in Rs lakh)	Total tentative cost (in Rs lakh)	Expected Annual GW recharge/ conservation (mcm)
Recharge Structures/ Activities						
Recharge shaft within the pond /tanks	Hard rock: Depth –60m, Dia 10-12”with filter pit	1	0.0431	2.6	2.6	0.0302
Impact assessment & Monitoring						
Piezometer	Up to 80 m bgl	1		0.6	0.6	
Impact assessment will be carried out by implementing agency						
O & M - 5% of total cost of the scheme					0.16	
TOTAL					**3.36**	

Note: Type, number and cost of structure may vary according to site after ground verification

Time Schedule

The project is to be implemented in two years, however impact assessment will be carried out for five years**.** A time schedule for different activities is given in table 6.

Table 6: Time Schedule

Steps	1st phase	2th Phase	3rd Phase	4th Phase	5th Phase	6th Phase	7th Phase	8th Phase
Constitution of State Level Technical Coordination Committee (SLTCC) and District Level Technical Coordination Committee (DLTCC)	■							
Arranging meeting of SLTCC for provision available under the scheme, request to implementing agencies for submission of DPR		■	■					
Scrutiny, recommendations & approval of AR Projects / Schemes in DLTCC & SLTCC		■	■					
Forwarding the DPR to Central Ground Water Board (CHQ), New Delhi for approval and issuing of sanction from the Ministry		■	■					
Meeting of TCC(CHQ) and release of sanction of funds		■	■					
Construction of artificial recharge structures & Monitoring of water levels in the area locally				■	■			
Completion and Utilisation certificate						■	■	
Impact Assessment and submission of report								■

Expected Benefits or outcome of the Plan

Ground water recharge and water conservation Plan of Masuda block, Ajmer envisages gainful utilization of 0.0302 MCM of surplus monsoon runoff for recharging of depleted aquifer system.

With the additional recharge and water conservation interventions as proposed in the Plan, it is anticipated that with enhanced recharge and reduction in ground water draft, the stage of ground water development will reduce to 113.51% from the existing 113.62%. The projected status of ground water resources and utilization scenario is presented in table 7.

Table 7: Projected Status of Groundwater Resource & Utilization

Net G.W. Availability (mcm)	Additional Recharge from RWH & conservation (mcm)	Total Net G.W. Availability after intervention (Ham)	Existing G.W Draft for all purpose (ham)	Saving of Ground water through projects (ham)	Net GW draft after interventions (ham)	Present stage of G.W. development (%)	Projected stage of G.W. Dev. (in %)
31.9959	0.0302	32.0261	36.3532	-	36.3532	113.62	113.51

- The implementation of the project would result in additional recharge. The other tangible/ non-tangible benefits of the project are:

- Recharging the ground water will help in arresting the rapid decline in ground water resources and will also ensure improvement in quality of ground water by way of dilution.
- Proposed structures and measures will also enhance the ground water potential and would ensure sustainability of ground water resources.
- Surface runoff water stored or harnessed can be used as supplemental irrigational resources and will reduce the stress on the ground water.
- Besides, it will also help in reducing the amount and spate of storm water being drained by river and controlling soil erosion.