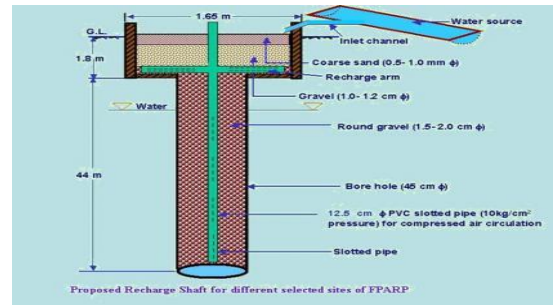




**CENTRAL GROUND WATER BOARD**  
MINISTRY OF WATER RESOURCES,  
RIVER DEVELOPMENT & GANGA REJUVENATION  
GOVERNMENT OF INDIA



Excavated/dugout farm pond



**ARTIFICIAL RECHARGE TO GROUND WATER AND  
WATER CONSERVATION PLAN OF SAPOTRA  
BLOCK, DISTRICT KARAU LI, RAJASTHAN**

Western Region, Jaipur  
October 2016

# ARTIFICIAL RECHARGE TO GROUND WATER AND WATER CONSERVATION PLAN OF SAPOTRA BLOCK, DISTRICT KARALI

## Plan at a Glance

1.	<b>Area of the Sapotra Block</b>	<b>1958.8 sq.km.</b>
2.	<b>Area identified for Artificial Recharge</b>	<b>1219.49sq km</b>
3.	<b>Dynamic Ground Water Resources (as on 31.03.2011)</b>	
	Net Ground Water Availability	<b>96.2778 MCM</b>
	Annual Ground Water Draft	<b>104.3963 MCM</b>
	Stage of Ground Water Development	<b>108.43%</b>
4.	<b>Volume of water to be harnessed</b>	<b>70.72 MCM</b>
	Volume of water available for recharge through RS	<b>6.055 MCM</b>
	Volume of water available for recharge through PT	<b>22.40 MCM</b>
5.	<b>Volume of unsaturated aquifer zone available for recharge</b>	<b>1126.29 MCM</b>
6.	<b>Total number of structures to be proposed</b>	
	<b>Recharge structures</b>	<b>173 shafts in 136 Nos. of existing village ponds</b>
	Existing village pond with recharge shaft/ well	
	Percolation Tanks	<b>112 No.</b>
	Sprinkler Irrigation	<b>300 ha</b>
	<b>Expected Annual GW recharge</b>	<b>22.764 MCM</b>
	<b>Provision for supplemental irrigation, thus reducing GW withdrawal for irrigation</b>	<b>0.24</b>
	<b>Total recharge/ saving of ground water</b>	<b>23.00 MCM</b>
7.	<b>Estimated Cost</b>	<b>57.971 crore</b>
	Artificial Recharge Plan	53.35 crore
	Sprinkler Irrigation	1.50 crore
	Piezometer construction	0.36 crore
	Operation and maintenance	2.761 crore

# ARTIFICIAL RECHARGE TO GROUND WATER AND WATER CONSERVATION PLAN OF SAPOTRA BLOCK, DISTRICT KARALI

## Introduction

The **Sapotra Block, district Karali** 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 **108.43%**.

## Location of the block

The Sapotra Block of Karali District covering an area of 1958.8 Sq. Km. falls in northern - central part of Karali District and is located between North latitudes 26°2' & 26°30' and East longitudes 76°33' & 77°23'.

## Surface Water Availability

As per the studies carried out by Water Resources Department (WRD), Government of Rajasthan there is very little surplus water available for further development at 75% dependability. Based on the data made available from GWD, the surplus runoff available at 75% dependability level has been worked out for the zones as part of watershed within the block. The nature of aquifer (Alluvium/ Hard rock) is also considered while computing the number of Artificial Recharge structures feasible.

Accordingly about 70.72 MCM has been considered for recharge plan in the block. Optimum utilization of rainwater runoff depends on availability of land, feasible conditions, etc. Volume of Aquifer available for Artificial Recharge is given in **Table.1**

## Supply Side Management

### Feasible Artificial Recharge and Water Conservation Structures

About 0.035 mcm/year surplus has been considered for each recharge shaft and 0.2 mcm/year for percolation tank wherever feasible. The areas with shallow water level (<5m) have not been considered for construction of Artificial Recharge Structures

The number of Recharge Shaft are decided based on the number of suitable ponds available within the zone. If still some surplus remained unallocated, than few Percolation tanks are proposed at suitable locations. However, in some of the blocks entire available surplus cannot be utilized due to non availability of ponds for Recharge shaft or suitable location for Percolation tanks. Zone wise number of Recharge Structures proposed to be constructed is given in **Table 2**.

**Table 1: Volume of Aquifer available for artificial recharge**

District	Block	Area of Block (Sq.km.)	Potential area suitable for recharge (Sq.km.)	Type of Aquifer	Area feasible for artificial recharge (Sq km)	Sp Yield	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)
Karauli	Sapotra	1958.8	1219.49	SR	481.92	0.12	18.30	15.30	884.81
				HR	737.57	0.02	19.37	16.37	241.48

**Table 2: Number of recharge structure**

ZoneCode	Sub_Basin	Type of Aquifer	Zone-Area (sq. km.)	Total Surplus (mcm)	Water Level >5m	Feasible RS_Prop	Feasible PT_Prop
Banas_Banas_003_RJ2304_AL	Banas	SR	24.02	1.27	Y	1	6
Banas_Kalisil_042_RJ2304_SR	Kalisil	SR	198.56	0.00	Y	0	0
Banas_Kalisil_043_RJ2304_AL	Kalisil	SR	81.90	0.89	Y	7	3
Banas_Kalisil_043_RJ2304_SR	Kalisil	HR	7.96	0.09	Y	0	0
Banas_Kalisil_043_RJ2304_SR	Kalisil	HR	109.14	1.19	Y	26	1
Banas_Kalisil_043_RJ2304_SR	Kalisil	HR	22.07	0.24	Y	3	1
Banas_Morel_064_RJ2304_AL	Morel	SR	274.13	6.10	Y	45	19
Banas_Morel_065_RJ2304_AL	Morel	SR	19.78	0.25	Y	0	1
Banas_Morel_067_RJ2304_AL	Morel	SR	46.93	0.53	Y	3	2
Chambal_Chambal Downstream_005_RJ2304_AL	Chambal Downstream	SR	268.88	22.73	Y	8	44
Chambal_Chambal Downstream_005_RJ2304_SR	Chambal Downstream	SR	308.55	26.08	Y	52	17
Chambal_Chambal Downstream_010_RJ2304_AL	Chambal Downstream	SR	101.37	4.71	Y	3	13
Chambal_Chambal Downstream_010_RJ2304_SR	Chambal Downstream	HR	140.03	6.50	Y	25	5
Gambhir_Gambhir_001_RJ2304_SR	Gambhir	SR	188.12	0.00	Y	0	0
Gambhir_Gambhir_010_RJ2304_SR	Gambhir	SR	18.52	0.14	N	0	0
Gambhir_Gambhir_014_RJ2304_SR	Gambhir	SR	2.05	0.00	Y	0	0
Parbati_Parbati_009_RJ2304_SR	Parbati	HR	0.94	0.00	Y	0	0
Parbati_Parbati_011_RJ2304_SR	Parbati	SR	14.49	0.00	Y	0	0
Parbati_Parbati_013_RJ2304_SR	Parbati	SR	131.73	0.00	Y	0	0
				70.72		173	112

## Recharge Shaft

It is proposed to construct Recharge Shaft in existing ponds. The selected ponds should be atleast 3m deep and shallow ponds will be deepened accordingly. It is proposed that the inlet for the Recharge Shaft should be atleast 1m above bed of pond so that the pond retains adequate water for use by villagers.

. The tentative location of villages for construction of recharge shaft/well in existing village pond and their cost estimates are shown in Fig 1 and Table 3.

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

S.No.	Village	Long	Lat	Watershed	No of Shafts	Unit cost (Rs in lac)	Total cost (Rs in lac)
1	Fatehpur	76.633	26.190	Banas_Banas_003_RJ2304_AL	1	5.00	5.00
2	Rooppura	76.627	26.249	Banas_Kalisil_043_RJ2304_AL	1	5.00	5.00
3	Kiradi	76.661	26.244	Banas_Kalisil_043_RJ2304_AL	1	5.00	5.00
4	Garhi Ka Gaon	76.638	26.231	Banas_Kalisil_043_RJ2304_AL	1	5.00	5.00
5	Saimarda	76.675	26.211	Banas_Kalisil_043_RJ2304_AL	1	5.00	5.00
6	Bhandaripura	76.744	26.264	Banas_Kalisil_043_RJ2304_AL	1	5.00	5.00
7	Kala Gurha	76.733	26.238	Banas_Kalisil_043_RJ2304_AL	1	5.00	5.00
8	Kala Gurha	76.722	26.229	Banas_Kalisil_043_RJ2304_AL	1	5.00	5.00
9	Nainiya Ki Guwari	76.790	26.212	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
10	Amargarh	76.783	26.224	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
11	Nainiya Ki Guwari	76.798	26.209	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
12	Unchi Guwari	76.758	26.213	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
13	Unchi Guwari	76.752	26.212	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
14	Unchi Guwari	76.760	26.206	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
15	Daulatpura	76.765	26.204	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
16	Doodha Ki Guwari	76.767	26.198	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
17	Daulatpura	76.775	26.187	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
18	Khoh	76.716	26.186	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
19	Khoh	76.720	26.185	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
20	Khoh	76.726	26.179	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
21	Khoh	76.724	26.172	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
22	Daulatpura	76.772	26.174	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
23	Matoriya Ki Guwari	76.776	26.156	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
24	Daulatpura	76.802	26.178	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
25	Daulatpura	76.805	26.175	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00

26	Chaurka Kalan	76.806	26.164	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
27	Chaurka Kalan	76.814	26.164	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
28	Jamooni	76.802	26.130	Banas_Kalisil_043_RJ2304_SR	1	5.00	5.00
29	Daulatpura	76.799	26.173	Banas_Kalisil_043_RJ2304_SR	2	5.00	10.00
30	Gorahar	76.719	26.256	Banas_Kalisil_043_RJ2304_SR	3	5.00	15.00
31	Nainiya Ki Guwari	76.814	26.205	Banas_Kalisil_043_RJ2304_SR	4	5.00	20.00
32	Rundi	76.804	26.450	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
33	Salempur	76.793	26.446	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
34	Mandawara	76.831	26.434	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
35	Lediya	76.830	26.413	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
36	Lediya	76.826	26.403	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
37	Lediya	76.827	26.400	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
38	Khirkhira	76.760	26.407	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
39	Bhartoon	76.736	26.393	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
40	Khidarpur	76.694	26.386	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
41	Masawata	76.698	26.338	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
42	Kachroda	76.812	26.385	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
43	Kudawada	76.835	26.380	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
44	Masawata	76.705	26.334	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
45	Tursangpura	76.749	26.318	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
46	Tursangpura	76.751	26.315	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
47	Keeratpura	76.759	26.323	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
48	Ada Doongar	76.813	26.328	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
49	Edalpur	76.618	26.315	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
50	Jeerota	76.681	26.302	Banas_Morel_064_RJ2304_AL	1	5.00	5.00
51	Dabra	76.760	26.384	Banas_Morel_064_RJ2304_AL	2	5.00	10.00
52	Dabra	76.783	26.377	Banas_Morel_064_RJ2304_AL	2	5.00	10.00
53	Mijhaura	76.793	26.309	Banas_Morel_064_RJ2304_AL	2	5.00	10.00
54	Jatwari	76.790	26.423	Banas_Morel_064_RJ2304_AL	3	5.00	15.00
55	Kachroda	76.808	26.381	Banas_Morel_064_RJ2304_AL	3	5.00	15.00
56	Lediya	76.837	26.390	Banas_Morel_064_RJ2304_AL	3	5.00	15.00
57	Bairunda	76.706	26.350	Banas_Morel_064_RJ2304_AL	3	5.00	15.00
58	Khera	76.814	26.422	Banas_Morel_064_RJ2304_AL	4	5.00	20.00
59	Baloti	76.766	26.418	Banas_Morel_064_RJ2304_AL	4	5.00	20.00
60	Edalpur	76.601	26.312	Banas_Morel_067_RJ2304_AL	1	5.00	5.00
61	Kherla	76.570	26.314	Banas_Morel_067_RJ2304_AL	1	5.00	5.00
62	Kherla	76.577	26.276	Banas_Morel_067_RJ2304_AL	1	5.00	5.00
63	Rodhai	77.180	26.272	Chambal_Chambal Downstream_005_RJ2304_AL	1	5.00	5.00
64	Rodhai	77.185	26.269	Chambal_Chambal Downstream_005_RJ2304_AL	1	5.00	5.00
65	Rodhai	77.168	26.257	Chambal_Chambal Downstream_005_RJ2304_AL	1	5.00	5.00
66	Khirkan	77.216	26.256	Chambal_Chambal Downstream_005_RJ2304_AL	1	5.00	5.00

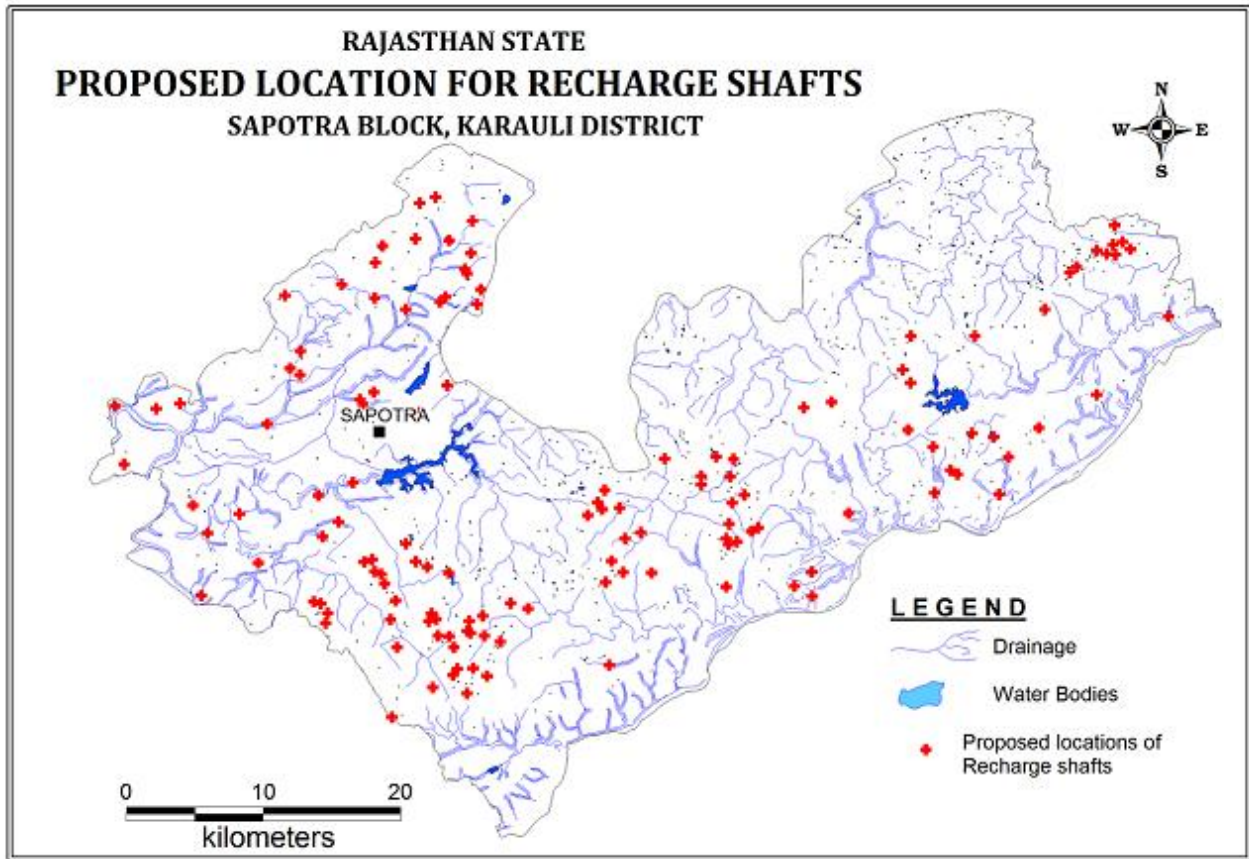
67	Nayagaon	77.222	26.280	Chambal_Chambal Downstream_005_RJ2304_AL	1	5.00	5.00
68	Simara	77.079	26.189	Chambal_Chambal Downstream_005_RJ2304_AL	1	5.00	5.00
69	Karai	77.016	26.196	Chambal_Chambal Downstream_005_RJ2304_AL	1	5.00	5.00
70	Chirchiri	76.931	26.144	Chambal_Chambal Downstream_005_RJ2304_AL	1	5.00	5.00
71	Kalakhet	77.093	26.317	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
72	Peepal Guwari	77.073	26.313	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
73	Rodhai	77.149	26.298	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
74	Rodhai	77.167	26.287	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
75	Rahir	76.972	26.279	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
76	Rahir	76.998	26.268	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
77	Rahir	76.998	26.263	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
78	Rahir	77.019	26.268	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
79	Rahir	77.022	26.279	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
80	Manikpura	77.029	26.256	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
81	Toda	77.020	26.251	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
82	Arora	77.105	26.244	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
83	Karai	77.018	26.237	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
84	Karai	77.016	26.227	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
85	Karai	77.018	26.223	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
86	Karai	77.024	26.225	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
87	Toda	77.035	26.232	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
88	Kased	77.040	26.234	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
89	Simara	77.078	26.205	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
90	Simara	77.066	26.196	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00

91	Chorka Khurd	76.818	26.156	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
92	Chaurka Kalan	76.828	26.167	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
93	Chaurka Kalan	76.830	26.166	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
94	Chaurka Kalan	76.829	26.174	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
95	Rawatpura	76.839	26.177	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
96	Choriya Khata	76.840	26.164	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
97	Baharda	76.852	26.160	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
98	Nibhaira	76.859	26.185	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
99	Nibhaira	76.872	26.182	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
100	Jamooni	76.820	26.142	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
101	Choriya Khata	76.832	26.143	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
102	Choriya Khata	76.842	26.137	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
103	Jamooni	76.817	26.138	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
104	Jamooni	76.827	26.126	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
105	Matoriya Ki Guwari	76.773	26.110	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
106	Raibeli Jagman	76.927	26.259	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
107	Khijoor	76.938	26.247	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
108	Khijoor	76.922	26.251	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
109	Khijoor	76.926	26.246	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
110	Veeram Ki Guwar	76.942	26.227	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
111	Mahal Dhankri	76.962	26.205	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
112	Asha Ki Guwari	76.941	26.205	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
113	Amarapur	76.928	26.199	Chambal_Chambal Downstream_005_RJ2304_SR	1	5.00	5.00
114	Khijoor	76.916	26.242	Chambal_Chambal Downstream_005_RJ2304_SR	2	5.00	10.00



115	Asha Ki Guwari	76.933	26.212	Chambal_Chambal Downstream_005_RJ2304_SR	2	5.00	10.00
116	Veeram Ki Guwar	76.954	26.231	Chambal_Chambal Downstream_005_RJ2304_SR	2	5.00	10.00
117	Rahir	77.009	26.280	Chambal_Chambal Downstream_005_RJ2304_SR	3	5.00	10.00
118	Ond	77.339	26.372	Chambal_Chambal Downstream_010_RJ2304_AL	1	5.00	5.00
119	Dargawan	77.287	26.321	Chambal_Chambal Downstream_010_RJ2304_AL	1	5.00	5.00
120	Mandrail	77.244	26.299	Chambal_Chambal Downstream_010_RJ2304_AL	1	5.00	5.00
121	Chandelipura	77.300	26.432	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
122	Chandelipura	77.286	26.415	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
123	Manakhur	77.271	26.405	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
124	Chandelipura	77.294	26.413	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
125	Chandelipura	77.298	26.419	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
126	Chandelipura	77.305	26.421	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
127	Chandelipura	77.311	26.416	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
128	Bagpur	77.248	26.377	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
129	Teen Pokhar	77.197	26.360	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
130	Langra	77.151	26.359	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
131	Gurja	77.145	26.337	Chambal_Chambal Downstream_010_RJ2304_SR	1	5.00	5.00
132	Gurja	77.151	26.329	Chambal_Chambal Downstream_010_RJ2304_SR	2	5.00	10.00
133	Chandelipura	77.300	26.413	Chambal_Chambal Downstream_010_RJ2304_SR	2	5.00	10.00
134	Manakhur	77.267	26.401	Chambal_Chambal Downstream_010_RJ2304_SR	2	5.00	10.00
135	Needar	77.195	26.296	Chambal_Chambal Downstream_010_RJ2304_SR	4	5.00	15.00
136	Bhattapura	77.211	26.294	Chambal_Chambal Downstream_010_RJ2304_SR	4	5.00	20.00
					<b>173</b>		<b>855.00</b>

**Figure 1: Showing Tentative location of the Recharge Shaft**



### Percolation Tank

The tentative location of villages for construction of percolation tank and their cost estimates are shown in Fig 2 and Table 4

**Table 4: Tentative locations of village for Percolation Tanks**

S. No.	Village	Longitude	Latitude	Micro Watershed	Unit Cost (Rs. In lacs)
1	Haroti	76.607	26.204	Banas_Banas_003_RJ2304_AL	40
2	Fatehpur	76.627	26.189	Banas_Banas_003_RJ2304_AL	40
3	Saimarda	76.670	26.204	Banas_Banas_003_RJ2304_AL	40

S. No.	Village	Longitude	Latitude	Micro Watershed	Unit Cost (Rs. In lacs)
4	Saimarda	76.673	26.200	Banas_Banas_003_RJ2304_AL	40
5	Simar	76.680	26.193	Banas_Banas_003_RJ2304_AL	40
6	Fatehpur	76.659	26.199	Banas_Banas_003_RJ2304_AL	40
7	Garhi Ka Gaon	76.633	26.231	Banas_Kalisil_043_RJ2304_AL	40
8	Bhandaripura	76.732	26.260	Banas_Kalisil_043_RJ2304_AL	40
9	Ganwda	76.657	26.251	Banas_Kalisil_043_RJ2304_AL	40
10	Daulatpura	76.778	26.196	Banas_Kalisil_043_RJ2304_SR	40
11	Matoriya Ki Guwari	76.779	26.163	Banas_Kalisil_043_RJ2304_SR	40
12	Khera	76.822	26.420	Banas_Morel_064_RJ2304_AL	40
13	Kudawada	76.801	26.402	Banas_Morel_064_RJ2304_AL	40
14	Khera	76.807	26.413	Banas_Morel_064_RJ2304_AL	40
15	Dabra	76.787	26.388	Banas_Morel_064_RJ2304_AL	40
16	Bhartoon	76.748	26.389	Banas_Morel_064_RJ2304_AL	40
17	Bhartoon	76.732	26.396	Banas_Morel_064_RJ2304_AL	40
18	Bairunda	76.697	26.354	Banas_Morel_064_RJ2304_AL	40
19	Bairunda	76.707	26.354	Banas_Morel_064_RJ2304_AL	40
20	Aurach	76.698	26.319	Banas_Morel_064_RJ2304_AL	40
21	Looloj	76.757	26.352	Banas_Morel_064_RJ2304_AL	40
22	Dabra	76.783	26.369	Banas_Morel_064_RJ2304_AL	40
23	Jakhoda	76.730	26.320	Banas_Morel_064_RJ2304_AL	40
24	Raneta	76.694	26.309	Banas_Morel_064_RJ2304_AL	40
25	Meenapura	76.645	26.302	Banas_Morel_064_RJ2304_AL	40
26	Neemoda	76.627	26.298	Banas_Morel_064_RJ2304_AL	40
27	Edalpur	76.628	26.307	Banas_Morel_064_RJ2304_AL	40
28	Inayati	76.737	26.341	Banas_Morel_064_RJ2304_AL	40
29	Dhoolwas	76.724	26.296	Banas_Morel_064_RJ2304_AL	40
30	Rundi	76.827	26.458	Banas_Morel_064_RJ2304_AL	40
31	Edalpur	76.586	26.320	Banas_Morel_065_RJ2304_AL	40
32	Haroti	76.595	26.234	Banas_Morel_067_RJ2304_AL	40
33	Gordhanpura	76.645	26.275	Banas_Morel_067_RJ2304_AL	40
34	Bharrpura	76.887	26.178	Chambal_Chambal Downstream_005_RJ2304_AL	40
35	Chaurghan	76.899	26.178	Chambal_Chambal Downstream_005_RJ2304_AL	40
36	Chaurghan	76.918	26.164	Chambal_Chambal Downstream_005_RJ2304_AL	40
37	Amarapur	76.942	26.172	Chambal_Chambal Downstream_005_RJ2304_AL	40
38	Bhaironpur	76.952	26.177	Chambal_Chambal Downstream_005_RJ2304_AL	40
39	Bhaironpur	76.961	26.168	Chambal_Chambal Downstream_005_RJ2304_AL	40
40	Dongri	76.961	26.129	Chambal_Chambal Downstream_005_RJ2304_AL	40

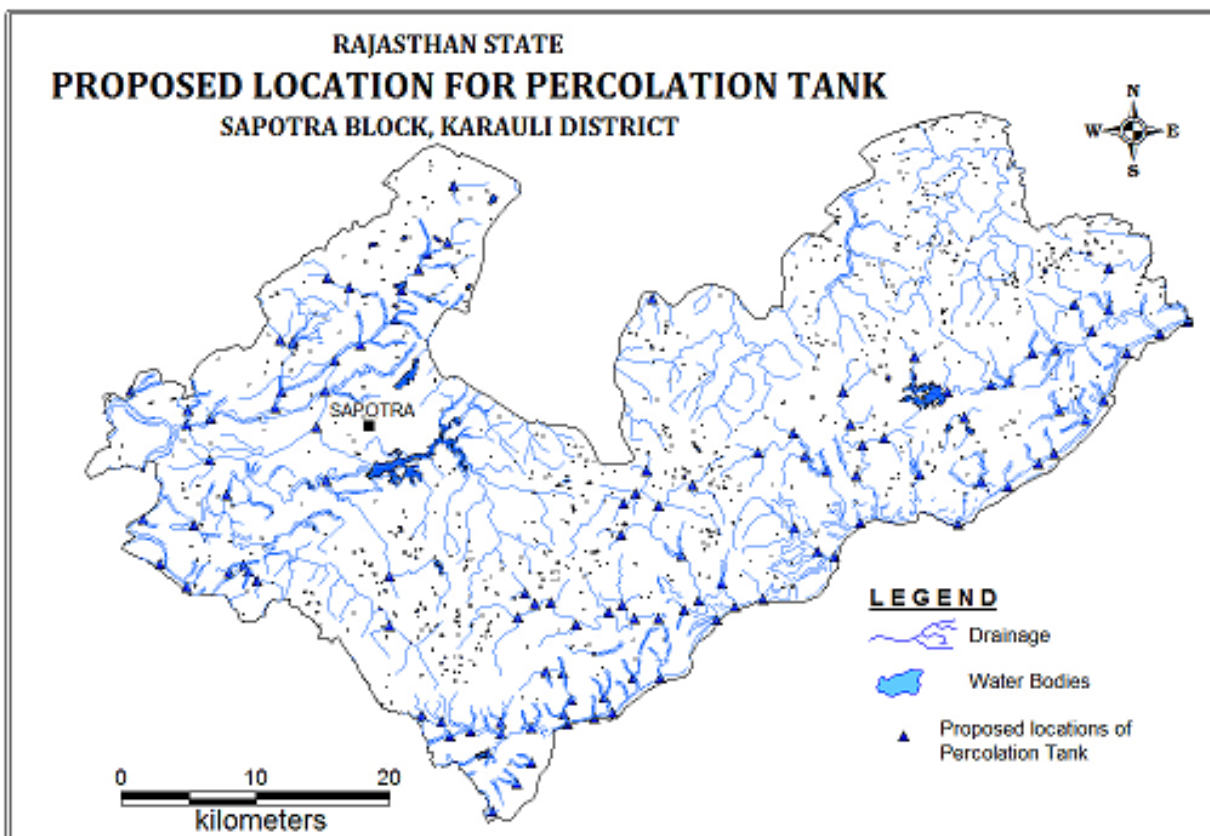
S. No.	Village	Longitude	Latitude	Micro Watershed	Unit Cost (Rs. In lacs)
41	Matoriya Ki Guwari	76.817	26.099	Chambal_Chambal Downstream_005_RJ2304_AL	40
42	Kanarda	76.839	26.093	Chambal_Chambal Downstream_005_RJ2304_AL	40
43	Matoriya Ki Guwari	76.824	26.090	Chambal_Chambal Downstream_005_RJ2304_AL	40
44	Kanarda	76.861	26.091	Chambal_Chambal Downstream_005_RJ2304_AL	40
45	Bilwas	76.852	26.078	Chambal_Chambal Downstream_005_RJ2304_AL	40
46	Gota	76.885	26.095	Chambal_Chambal Downstream_005_RJ2304_AL	40
47	Bilwas	76.855	26.039	Chambal_Chambal Downstream_005_RJ2304_AL	40
48	Bilwas	76.874	26.057	Chambal_Chambal Downstream_005_RJ2304_AL	40
49	Bilwas	76.884	26.072	Chambal_Chambal Downstream_005_RJ2304_AL	40
50	Ghata	76.931	26.102	Chambal_Chambal Downstream_005_RJ2304_AL	40
51	Gota	76.911	26.098	Chambal_Chambal Downstream_005_RJ2304_AL	40
52	Gota	76.909	26.104	Chambal_Chambal Downstream_005_RJ2304_AL	40
53	Akoriya	76.914	26.114	Chambal_Chambal Downstream_005_RJ2304_AL	40
54	Ghata	76.938	26.115	Chambal_Chambal Downstream_005_RJ2304_AL	40
55	Manki	76.945	26.105	Chambal_Chambal Downstream_005_RJ2304_AL	40
56	Dangariya	76.981	26.128	Chambal_Chambal Downstream_005_RJ2304_AL	40
57	Karanpur	76.980	26.168	Chambal_Chambal Downstream_005_RJ2304_AL	40
58	Garhi Ka Gaon	76.998	26.174	Chambal_Chambal Downstream_005_RJ2304_AL	40
59	Dhusai	77.023	26.167	Chambal_Chambal Downstream_005_RJ2304_AL	40
60	Garhi Ka Gaon	77.010	26.180	Chambal_Chambal Downstream_005_RJ2304_AL	40
61	Garhi Ka Gaon	76.996	26.210	Chambal_Chambal Downstream_005_RJ2304_AL	40
62	Karai	77.037	26.176	Chambal_Chambal Downstream_005_RJ2304_AL	40
63	Karai	77.026	26.192	Chambal_Chambal Downstream_005_RJ2304_AL	40

S. No.	Village	Longitude	Latitude	Micro Watershed	Unit Cost (Rs. In lacs)
64	Toda	77.057	26.181	Chambal_Chambal Downstream_005_RJ2304_AL	40
65	Kased	77.110	26.209	Chambal_Chambal Downstream_005_RJ2304_AL	40
66	Kased	77.081	26.229	Chambal_Chambal Downstream_005_RJ2304_AL	40
67	Rodhai	77.129	26.232	Chambal_Chambal Downstream_005_RJ2304_AL	40
68	Chandeli	77.131	26.284	Chambal_Chambal Downstream_005_RJ2304_AL	40
69	Rodhai	77.127	26.264	Chambal_Chambal Downstream_005_RJ2304_AL	40
70	Rodhai	77.174	26.265	Chambal_Chambal Downstream_005_RJ2304_AL	40
71	Khirkan	77.203	26.231	Chambal_Chambal Downstream_005_RJ2304_AL	40
72	Mogepura	77.220	26.260	Chambal_Chambal Downstream_005_RJ2304_AL	40
73	Mogepura	77.240	26.257	Chambal_Chambal Downstream_005_RJ2304_AL	40
74	Chak Mandrail	77.262	26.272	Chambal_Chambal Downstream_005_RJ2304_AL	40
75	Barred	77.275	26.278	Chambal_Chambal Downstream_005_RJ2304_AL	40
76	Kased	77.098	26.213	Chambal_Chambal Downstream_005_RJ2304_AL	40
77	Kanarda	76.802	26.103	Chambal_Chambal Downstream_005_RJ2304_AL	40
78	Matoriya Ki Guwari	76.862	26.098	Chambal_Chambal Downstream_005_RJ2304_SR	40
79	Gota	76.895	26.133	Chambal_Chambal Downstream_005_RJ2304_SR	40
80	Gota	76.908	26.132	Chambal_Chambal Downstream_005_RJ2304_SR	40
81	Nibhaira	76.874	26.169	Chambal_Chambal Downstream_005_RJ2304_SR	40
82	Nibhaira	76.880	26.185	Chambal_Chambal Downstream_005_RJ2304_SR	40
83	Veeram Ki Guwar	76.951	26.224	Chambal_Chambal Downstream_005_RJ2304_SR	40
84	Khijoor	76.953	26.245	Chambal_Chambal Downstream_005_RJ2304_SR	40
85	Raibeli Jagman	76.962	26.252	Chambal_Chambal Downstream_005_RJ2304_SR	40
86	Rahir	76.979	26.244	Chambal_Chambal Downstream_005_RJ2304_SR	40

S. No.	Village	Longitude	Latitude	Micro Watershed	Unit Cost (Rs. In lacs)
87	Rahir	76.971	26.267	Chambal_Chambal Downstream_005_RJ2304_SR	40
88	Rahir	77.004	26.257	Chambal_Chambal Downstream_005_RJ2304_SR	40
89	Davar Khargamanshah	77.053	26.279	Chambal_Chambal Downstream_005_RJ2304_SR	40
90	Chirmil	77.080	26.292	Chambal_Chambal Downstream_005_RJ2304_SR	40
91	Chirmil	77.089	26.277	Chambal_Chambal Downstream_005_RJ2304_SR	40
92	Arora	77.105	26.267	Chambal_Chambal Downstream_005_RJ2304_SR	40
93	Chhawripura	77.122	26.298	Chambal_Chambal Downstream_005_RJ2304_SR	40
94	Rodhai	77.147	26.289	Chambal_Chambal Downstream_005_RJ2304_SR	40
95	Needar	77.194	26.320	Chambal_Chambal Downstream_010_RJ2304_AL	40
96	Ghatooli	77.227	26.325	Chambal_Chambal Downstream_010_RJ2304_AL	40
97	Ghatooli	77.241	26.327	Chambal_Chambal Downstream_010_RJ2304_AL	40
98	Pancholi	77.278	26.307	Chambal_Chambal Downstream_010_RJ2304_AL	40
99	Pancholi	77.297	26.301	Chambal_Chambal Downstream_010_RJ2304_AL	40
100	Rancholi	77.311	26.314	Chambal_Chambal Downstream_010_RJ2304_AL	40
101	Ond	77.329	26.346	Chambal_Chambal Downstream_010_RJ2304_AL	40
102	Ond	77.353	26.359	Chambal_Chambal Downstream_010_RJ2304_AL	40
103	Ond	77.374	26.367	Chambal_Chambal Downstream_010_RJ2304_AL	40
104	Ond	77.315	26.375	Chambal_Chambal Downstream_010_RJ2304_AL	40
105	Ond	77.303	26.360	Chambal_Chambal Downstream_010_RJ2304_AL	40
106	Dargawan	77.275	26.348	Chambal_Chambal Downstream_010_RJ2304_AL	40
107	Dhoreta	77.258	26.346	Chambal_Chambal Downstream_010_RJ2304_AL	40
108	Doylepura	77.117	26.320	Chambal_Chambal Downstream_010_RJ2304_SR	40
109	Shyampur	77.170	26.343	Chambal_Chambal Downstream_010_RJ2304_SR	40

S. No.	Village	Longitude	Latitude	Micro Watershed	Unit Cost (Rs. In lacs)
110	Bhattpura	77.208	26.302	Chambal_Chambal Downstream_010_RJ2304_SR	40
111	Ond	77.315	26.402	Chambal_Chambal Downstream_010_RJ2304_SR	40
112	Bheret	77.289	26.378	Chambal_Chambal Downstream_010_RJ2304_SR	40
			<b>Total</b>		<b>4480</b>

**Fig. 2: Tentative location of Percolation Tanks**



## Demand Side Management

### Efficient Irrigation:

In Flood/ furrow irrigation method more than 50% of applied water is wasted through seepage to deeper levels, local inundation causes loss through evaporation and it leaches out the nutrients from the plants. While through drip and sprinkler irrigation method, wastage through irrigation losses could be minimized. Ground water usage can be minimized drastically by using HDPE pipes. Initially the scheme can be proposed to be started in 300 ha area, which is worst affected showing deepest water level and declining trends. The area is to be finalized based on land holdings, willingness of farmers and No Objection certificate from the land owner.

### 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.

It is proposed to construct 60 piezometers, at suitable locations for monitoring of water levels, in the vicinity of proposed recharge structure.

### Revival, Repair of Water Bodies

The existing ponds and tanks with time 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.

### Financial Outlay of the Plan

The total estimated cost of the Plan is Rs. 57.9705 cr. The tentative cost estimates of the various activities of the Plan are shown in Table 5 & 6. The unit rates are as followed by the Govt. of Rajasthan (BSR).

**Table 5: Cost of the recharge structures**

Cost Recharge Shaft Rs in crs (Unit cost Rs 0.05 cr for alluvium and Rs 0.026 cr for hard rock)	Cost of Percolation Tank in Rs in crs (Unit cost Rs 0.4 cr)	Cost of Sprinkler irrigation in Rs (Unit cost 0.005 cr/ha)
Soft rock – 8.55	44.80	1.50



**Table 6: Tentative cost of different activities**

Feasible Artificial Recharge & Water Conservation structures/ activities	Tentative Design	Quantity (in nos. or area in ha)	Rainwater harvested (mcm ) or No. of sprinklers (/ha)	Tentative unit cost (in Rs lakh)	Total tentative cost (in Rs lakh)	Expected Annual GW recharge/ conservation (mcm) @ 0.8 mcm/structure
<b>Recharge Structures/ Activities</b>						
Recharge shaft within the pond /tanks	Alluvium – Depth 80m, Dia: 10-12” with filter pit	173	6.055	5	855	4.844
	Hard rock: Depth –60m, Dia 10-12”with filter pit	-	-	-	-	-
Percolation tanks (3 fillings)	200m*200m*1.5 m	112	22.40	40	4480	17.92
Water Conservation Measures	Sprinkler Irrigation	300 ha	25	0.5/ha	150	0.24
		<b>Total</b>			<b>5485</b>	<b>23.004</b>
<b>Impact assessment &amp; Monitoring</b>						
Piezometer	50 – 80 m	60		0.6	36	
<i>Impact assessment will be carried out by implementing agency</i>						
O & M - 5% of total cost of the scheme					276.05	
<b>TOTAL</b>					<b>5797.05</b>	<b>23.00</b>

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