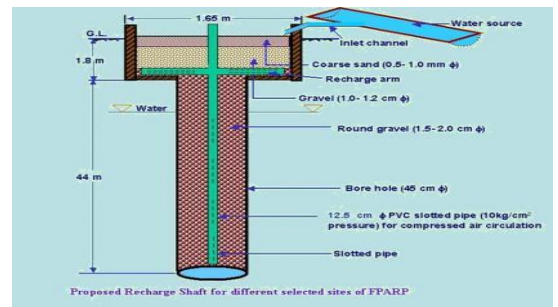
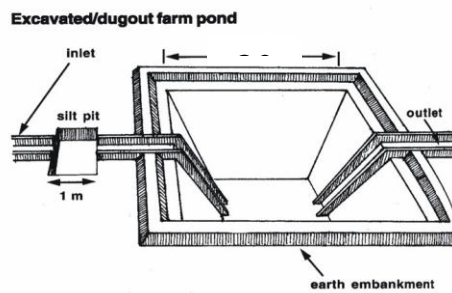




CENTRAL GROUND WATER BOARD
MINISTRY OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION
GOVERNMENT OF INDIA



**ARTIFICIAL RECHARGE TO GROUND WATER AND
WATER CONSERVATION PLAN OF BAMNAWAS
BLOCK, DISTRICT SAWAI MADHOPUR,**

Western Region, Jaipur
February 2017

ARTIFICIAL RECHARGE TO GROUND WATER AND WATER CONSERVATION PLAN OF BAMNAWAS BLOCK, DISTRICT SAWAI MADHOPUR

Plan at a Glance

1.	Area of the Bamnawas Block	721.10 Sq. km.
2.	Area identified for Artificial Recharge	656.55 sq km
3.	Dynamic Ground Water Resources (as on 31.03.2011)	
	Net Ground Water Availability	64.96 MCM
	Annual Ground Water Draft	73.63 MCM
	Stage of Ground Water Development	113.34 %
4.	Volume of water to be harnessed	8.52 MCM
	Volume of water available for recharge through RS	8.52 MCM
	Volume of water available for recharge through PT	-
5.	Volume of unsaturated aquifer zone available for recharge	272 MCM
6.	Total number of structures to be proposed	
	Recharge structures	243 shafts in 243
	Existing village pond with recharge shaft/ well	Nos. of existing
		village ponds
	Percolation Tanks	-
	Sprinkler Irrigation	300 ha
	Expected Annual GW recharge	6.82 MCM
	Provision for supplemental irrigation, thus reducing GW withdrawal for irrigation	0.24
	Total recharge/ saving of ground water	7.06 MCM
7.	Estimated Cost	14.963 crore
	Artificial Recharge Plan	12.15 crore
	Sprinkler Irrigation	1.50 crore
	Piezometer construction	0.60 crore
	Operation and maintenance	0.713 crore

ARTIFICIAL RECHARGE TO GROUND WATER AND WATER CONSERVATION PLAN OF BAMNAWAS BLOCK, DISTRICT SAWAI MADHOPUR

Introduction

The **Bamnawas Block, district Sawai Madhopur** 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 **113.34%**. 656.55 sq. km. area is potential zone area and thus feasible for artificial recharge.

Location of the block

The Bamnawas Block covers an area of 721.10 Sq. km. and falls in **northern-central** part of Sawai Madhopur district. It is located between North latitudes 26°16' & 26°43' and East longitudes 76°24' & 76°42'.

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 8.52 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 is 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)
Sawai Madhopur	Bamnawas	721.1	656.55	SR	579.06	0.060	10.55	7.55	262.314
				HR	77.491	0.010	15.5	12.5	9.686

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_Morel_065_RJ2901_AL	Morel	SR	569.375	7.222	Y	206	0
Banas_Morel_066_RJ2901_AL	Morel	SR	81.646	0.000	Y	0	0
Banas_Morel_067_RJ2901_AL	Morel	SR	114.204	1.301	Y	37	0
Banganga_Banganga_024_RJ2901_HR	Banganga	HR	5.317	0.000	Y	0	0
Gambhir_Gambhir_002_RJ2901_AL	Gambhir	SR	0.636	0.001	Y	0	0
				8.524		243	0

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.	Doongarwara	76.549	26.662	Banas_Morel_065_RJ2901_AL	1	5	5
2.	Doongarwara	76.568	26.657	Banas_Morel_065_RJ2901_AL	1	5	5
3.	Tundeela	76.566	26.648	Banas_Morel_065_RJ2901_AL	1	5	5
4.	Tundeela	76.569	26.642	Banas_Morel_065_RJ2901_AL	1	5	5
5.	Tundeela	76.577	26.662	Banas_Morel_065_RJ2901_AL	1	5	5
6.	Tundeela	76.585	26.662	Banas_Morel_065_RJ2901_AL	1	5	5
7.	Tundeela	76.592	26.651	Banas_Morel_065_RJ2901_AL	1	5	5
8.	Tundeela	76.596	26.652	Banas_Morel_065_RJ2901_AL	1	5	5
9.	Tundeela	76.602	26.662	Banas_Morel_065_RJ2901_AL	1	5	5
10.	Sherpur Donay	76.611	26.654	Banas_Morel_065_RJ2901_AL	1	5	5
11.	Sherpur Donay	76.618	26.659	Banas_Morel_065_RJ2901_AL	1	5	5
12.	Goojar Koleta	76.551	26.629	Banas_Morel_065_RJ2901_AL	1	5	5
13.	Jagrampura	76.535	26.619	Banas_Morel_065_RJ2901_AL	1	5	5
14.	Barh Raghopura	76.539	26.616	Banas_Morel_065_RJ2901_AL	1	5	5
15.	Barh Raghopura	76.543	26.617	Banas_Morel_065_RJ2901_AL	1	5	5
16.	Barh Raghopura	76.547	26.611	Banas_Morel_065_RJ2901_AL	1	5	5
17.	Shyampura	76.548	26.606	Banas_Morel_065_RJ2901_AL	1	5	5
18.	Shyampura	76.550	26.601	Banas_Morel_065_RJ2901_AL	1	5	5
19.	Raghopura	76.527	26.599	Banas_Morel_065_RJ2901_AL	1	5	5
20.	Raghopura	76.527	26.595	Banas_Morel_065_RJ2901_AL	1	5	5
21.	Barh Raghopura	76.518	26.597	Banas_Morel_065_RJ2901_AL	1	5	5
22.	Barh Raghopura	76.516	26.603	Banas_Morel_065_RJ2901_AL	1	5	5
23.	Naneta Khera	76.519	26.608	Banas_Morel_065_RJ2901_AL	1	5	5
24.	Naneta Khera	76.523	26.612	Banas_Morel_065_RJ2901_AL	1	5	5
25.	Meena Koleta	76.516	26.616	Banas_Morel_065_RJ2901_AL	1	5	5
26.	Naneta Khera	76.510	26.613	Banas_Morel_065_RJ2901_AL	1	5	5
27.	Naneta Khera	76.509	26.611	Banas_Morel_065_RJ2901_AL	1	5	5
28.	Jahra	76.568	26.604	Banas_Morel_065_RJ2901_AL	1	5	5
29.	Kiratpura	76.566	26.597	Banas_Morel_065_RJ2901_AL	1	5	5
30.	Bamanwas Patti Khurd	76.572	26.591	Banas_Morel_065_RJ2901_AL	1	5	5
31.	Bamanwas Patti Khurd	76.562	26.592	Banas_Morel_065_RJ2901_AL	1	5	5
32.	Bamanwas	76.560	26.586	Banas_Morel_065_RJ2901_AL	1	5	5

	Patti Khurd						
33.	Bamanwas Patti Khurd	76.559	26.576	Banas_Morel_065_RJ2901_AL	1	5	5
34.	Bamanwas Patti Khurd	76.549	26.579	Banas_Morel_065_RJ2901_AL	1	5	5
35.	Bamanwas Patti Khurd	76.551	26.569	Banas_Morel_065_RJ2901_AL	1	5	5
36.	Bamanwas Patti Kalan	76.567	26.558	Banas_Morel_065_RJ2901_AL	1	5	5
37.	Bamanwas Patti Khurd	76.577	26.563	Banas_Morel_065_RJ2901_AL	1	5	5
38.	Bamanwas Patti Khurd	76.572	26.565	Banas_Morel_065_RJ2901_AL	1	5	5
39.	Bamanwas Patti Khurd	76.563	26.566	Banas_Morel_065_RJ2901_AL	1	5	5
40.	Bamanwas Patti Khurd	76.568	26.575	Banas_Morel_065_RJ2901_AL	1	5	5
41.	Bamanwas Patti Khurd	76.570	26.573	Banas_Morel_065_RJ2901_AL	1	5	5
42.	Bamanwas Patti Khurd	76.577	26.571	Banas_Morel_065_RJ2901_AL	1	5	5
43.	Bamanwas Patti Khurd	76.575	26.582	Banas_Morel_065_RJ2901_AL	1	5	5
44.	Bamanwas Patti Khurd	76.581	26.579	Banas_Morel_065_RJ2901_AL	1	5	5
45.	Bamanwas Patti Kalan	76.527	26.558	Banas_Morel_065_RJ2901_AL	1	5	5
46.	Liwali	76.515	26.557	Banas_Morel_065_RJ2901_AL	1	5	5
47.	Liwali	76.508	26.561	Banas_Morel_065_RJ2901_AL	1	5	5
48.	Liwali	76.502	26.560	Banas_Morel_065_RJ2901_AL	1	5	5
49.	Liwali	76.512	26.560	Banas_Morel_065_RJ2901_AL	1	5	5
50.	Liwali	76.515	26.560	Banas_Morel_065_RJ2901_AL	1	5	5
51.	Liwali	76.522	26.562	Banas_Morel_065_RJ2901_AL	1	5	5
52.	Naharsinghpur a	76.529	26.567	Banas_Morel_065_RJ2901_AL	1	5	5
53.	Liwali	76.508	26.565	Banas_Morel_065_RJ2901_AL	1	5	5
54.	Liwali	76.506	26.570	Banas_Morel_065_RJ2901_AL	1	5	5
55.	Liwali	76.502	26.568	Banas_Morel_065_RJ2901_AL	1	5	5
56.	Gothra	76.509	26.574	Banas_Morel_065_RJ2901_AL	1	5	5
57.	Gothra	76.505	26.577	Banas_Morel_065_RJ2901_AL	1	5	5
58.	Kakrala	76.506	26.581	Banas_Morel_065_RJ2901_AL	1	5	5
59.	Kakrala	76.508	26.584	Banas_Morel_065_RJ2901_AL	1	5	5
60.	Kakrala	76.516	26.586	Banas_Morel_065_RJ2901_AL	1	5	5
61.	Kakrala	76.517	26.590	Banas_Morel_065_RJ2901_AL	1	5	5
62.	Kakrala	76.527	26.585	Banas_Morel_065_RJ2901_AL	1	5	5
63.	Kakrala	76.530	26.575	Banas_Morel_065_RJ2901_AL	1	5	5
64.	Kakrala	76.534	26.578	Banas_Morel_065_RJ2901_AL	1	5	5

65.	Naharsinghpura	76.524	26.573	Banas_Morel_065_RJ2901_AL	1	5	5
66.	Gothra	76.517	26.569	Banas_Morel_065_RJ2901_AL	1	5	5
67.	Liwali	76.489	26.557	Banas_Morel_065_RJ2901_AL	1	5	5
68.	Liwali	76.504	26.555	Banas_Morel_065_RJ2901_AL	1	5	5
69.	Liwali	76.500	26.549	Banas_Morel_065_RJ2901_AL	1	5	5
70.	Nawar Kishanpura	76.486	26.547	Banas_Morel_065_RJ2901_AL	1	5	5
71.	Nawar Kishanpura	76.482	26.542	Banas_Morel_065_RJ2901_AL	1	5	5
72.	Nawar Kishanpura	76.478	26.542	Banas_Morel_065_RJ2901_AL	1	5	5
73.	Khatana	76.475	26.539	Banas_Morel_065_RJ2901_AL	1	5	5
74.	Nawar Kishanpura	76.475	26.545	Banas_Morel_065_RJ2901_AL	1	5	5
75.	Nawar Kishanpura	76.479	26.547	Banas_Morel_065_RJ2901_AL	1	5	5
76.	Nawar Kishanpura	76.486	26.550	Banas_Morel_065_RJ2901_AL	1	5	5
77.	Nawar Kishanpura	76.485	26.552	Banas_Morel_065_RJ2901_AL	1	5	5
78.	Kohli Prempura	76.517	26.532	Banas_Morel_065_RJ2901_AL	1	5	5
79.	Kohli Prempura	76.526	26.535	Banas_Morel_065_RJ2901_AL	1	5	5
80.	Bamanwas Patti Kalan	76.552	26.522	Banas_Morel_065_RJ2901_AL	1	5	5
81.	Bamanwas Patti Kalan	76.558	26.537	Banas_Morel_065_RJ2901_AL	1	5	5
82.	Bamanwas Patti Kalan	76.561	26.536	Banas_Morel_065_RJ2901_AL	1	5	5
83.	Bamanwas Patti Kalan	76.564	26.527	Banas_Morel_065_RJ2901_AL	1	5	5
84.	Bamanwas Patti Kalan	76.569	26.531	Banas_Morel_065_RJ2901_AL	1	5	5
85.	Bamanwas Patti Kalan	76.577	26.525	Banas_Morel_065_RJ2901_AL	1	5	5
86.	Bamanwas Patti Kalan	76.576	26.554	Banas_Morel_065_RJ2901_AL	1	5	5
87.	Bamanwas Patti Kalan	76.570	26.554	Banas_Morel_065_RJ2901_AL	1	5	5
88.	Bamanwas Patti Kalan	76.569	26.546	Banas_Morel_065_RJ2901_AL	1	5	5
89.	Bamanwas Patti Kalan	76.562	26.547	Banas_Morel_065_RJ2901_AL	1	5	5
90.	Tajpura	76.475	26.518	Banas_Morel_065_RJ2901_AL	1	5	5
91.	Kohli Prempura	76.522	26.521	Banas_Morel_065_RJ2901_AL	1	5	5

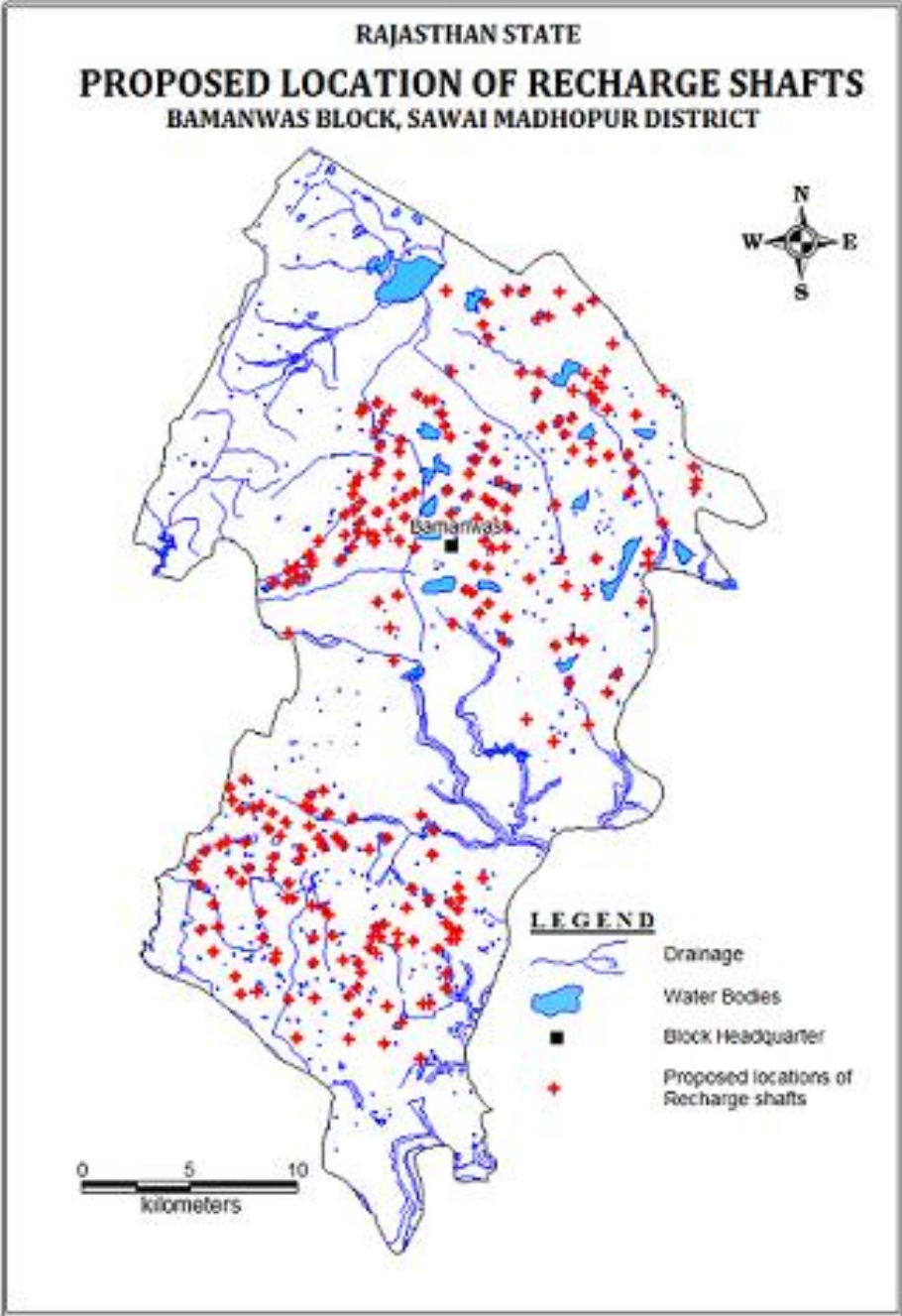
92.	Kherli	76.524	26.507	Banas_Morel_065_RJ2901_AL	1	5	5
93.	Theekarya	76.584	26.628	Banas_Morel_065_RJ2901_AL	1	5	5
94.	Theekarya	76.591	26.619	Banas_Morel_065_RJ2901_AL	1	5	5
95.	Theekarya	76.592	26.628	Banas_Morel_065_RJ2901_AL	1	5	5
96.	Bareela	76.601	26.607	Banas_Morel_065_RJ2901_AL	1	5	5
97.	Bareela	76.593	26.605	Banas_Morel_065_RJ2901_AL	1	5	5
98.	Bareela	76.604	26.602	Banas_Morel_065_RJ2901_AL	1	5	5
99.	Barh Bareela	76.608	26.595	Banas_Morel_065_RJ2901_AL	1	5	5
100.	Kadeepur	76.617	26.598	Banas_Morel_065_RJ2901_AL	1	5	5
101.	Bareela	76.608	26.609	Banas_Morel_065_RJ2901_AL	1	5	5
102.	Danta Sooti	76.608	26.620	Banas_Morel_065_RJ2901_AL	1	5	5
103.	Barh Danta Sooti	76.614	26.627	Banas_Morel_065_RJ2901_AL	1	5	5
104.	Raneela	76.617	26.619	Banas_Morel_065_RJ2901_AL	1	5	5
105.	Raneela	76.618	26.616	Banas_Morel_065_RJ2901_AL	1	5	5
106.	Raneela	76.624	26.612	Banas_Morel_065_RJ2901_AL	1	5	5
107.	Raneela	76.638	26.610	Banas_Morel_065_RJ2901_AL	1	5	5
108.	Raneela	76.650	26.621	Banas_Morel_065_RJ2901_AL	1	5	5
109.	Raneela	76.621	26.621	Banas_Morel_065_RJ2901_AL	1	5	5
110.	Raneela	76.619	26.624	Banas_Morel_065_RJ2901_AL	1	5	5
111.	Raneela	76.623	26.628	Banas_Morel_065_RJ2901_AL	1	5	5
112.	Barh Danta Sooti	76.627	26.640	Banas_Morel_065_RJ2901_AL	1	5	5
113.	Jharoli	76.616	26.591	Banas_Morel_065_RJ2901_AL	1	5	5
114.	Jharoli	76.625	26.593	Banas_Morel_065_RJ2901_AL	1	5	5
115.	Jharoli	76.634	26.594	Banas_Morel_065_RJ2901_AL	1	5	5
116.	Sarai	76.636	26.586	Banas_Morel_065_RJ2901_AL	1	5	5
117.	Sarai	76.634	26.578	Banas_Morel_065_RJ2901_AL	1	5	5
118.	Gandal	76.665	26.579	Banas_Morel_065_RJ2901_AL	1	5	5
119.	Gandal	76.666	26.582	Banas_Morel_065_RJ2901_AL	1	5	5
120.	Gandal	76.665	26.589	Banas_Morel_065_RJ2901_AL	1	5	5
121.	Kundli	76.650	26.565	Banas_Morel_065_RJ2901_AL	1	5	5
122.	Bamanwas Patti Khurd	76.600	26.573	Banas_Morel_065_RJ2901_AL	1	5	5
123.	Bamanwas Patti Kalan	76.603	26.550	Banas_Morel_065_RJ2901_AL	1	5	5
124.	Bamanwas Patti Kalan	76.588	26.541	Banas_Morel_065_RJ2901_AL	1	5	5
125.	Bamanwas Patti Kalan	76.605	26.539	Banas_Morel_065_RJ2901_AL	1	5	5
126.	Radheki	76.619	26.550	Banas_Morel_065_RJ2901_AL	1	5	5
127.	Bamanwas Patti Kalan	76.615	26.535	Banas_Morel_065_RJ2901_AL	1	5	5
128.	Nagtalai	76.644	26.548	Banas_Morel_065_RJ2901_AL	1	5	5
129.	Nagtalai	76.643	26.552	Banas_Morel_065_RJ2901_AL	1	5	5

130.	Bhautai	76.640	26.532	Banas_Morel_065_RJ2901_AL	1	5	5
131.	Sitor	76.576	26.516	Banas_Morel_065_RJ2901_AL	1	5	5
132.	Bamanwas Patti Kalan	76.600	26.514	Banas_Morel_065_RJ2901_AL	1	5	5
133.	Sarangpura	76.608	26.516	Banas_Morel_065_RJ2901_AL	1	5	5
134.	Sarangpura	76.613	26.516	Banas_Morel_065_RJ2901_AL	1	5	5
135.	Gahnoli	76.606	26.498	Banas_Morel_065_RJ2901_AL	1	5	5
136.	Dhoodhoopur a	76.629	26.502	Banas_Morel_065_RJ2901_AL	1	5	5
137.	Barh Koyla	76.624	26.494	Banas_Morel_065_RJ2901_AL	1	5	5
138.	Baman Baroda	76.615	26.480	Banas_Morel_065_RJ2901_AL	1	5	5
139.	Goojar Barauda	76.599	26.473	Banas_Morel_065_RJ2901_AL	1	5	5
140.	Goojar Barauda	76.587	26.483	Banas_Morel_065_RJ2901_AL	1	5	5
141.	Bamanwas Patti Kalan	76.534	26.554	Banas_Morel_065_RJ2901_AL	1	5	5
142.	Khatana	76.467	26.539	Banas_Morel_065_RJ2901_AL	1	5	5
143.	Naroli Chaur	76.455	26.457	Banas_Morel_065_RJ2901_AL	1	5	5
144.	Naroli Chaur	76.448	26.454	Banas_Morel_065_RJ2901_AL	1	5	5
145.	Naroli Chaur	76.449	26.449	Banas_Morel_065_RJ2901_AL	1	5	5
146.	Barh Sancholi	76.453	26.445	Banas_Morel_065_RJ2901_AL	1	5	5
147.	Bhanwarki	76.459	26.446	Banas_Morel_065_RJ2901_AL	1	5	5
148.	Bhanwarki	76.463	26.447	Banas_Morel_065_RJ2901_AL	1	5	5
149.	Bhanwarki	76.467	26.443	Banas_Morel_065_RJ2901_AL	1	5	5
150.	Bhanwarki	76.466	26.437	Banas_Morel_065_RJ2901_AL	1	5	5
151.	Bhanwarki	76.471	26.434	Banas_Morel_065_RJ2901_AL	1	5	5
152.	Bhanwarki	76.474	26.440	Banas_Morel_065_RJ2901_AL	1	5	5
153.	Bichhauchh	76.491	26.453	Banas_Morel_065_RJ2901_AL	1	5	5
154.	Bichhauchh	76.486	26.451	Banas_Morel_065_RJ2901_AL	1	5	5
155.	Bichhauchh	76.483	26.447	Banas_Morel_065_RJ2901_AL	1	5	5
156.	Bichhauchh	76.486	26.445	Banas_Morel_065_RJ2901_AL	1	5	5
157.	Bichhauchh	76.493	26.443	Banas_Morel_065_RJ2901_AL	1	5	5
158.	Bichhauchh	76.505	26.441	Banas_Morel_065_RJ2901_AL	1	5	5
159.	Bairada	76.521	26.432	Banas_Morel_065_RJ2901_AL	1	5	5
160.	Bairada	76.513	26.428	Banas_Morel_065_RJ2901_AL	1	5	5
161.	Bichhauchh	76.501	26.430	Banas_Morel_065_RJ2901_AL	1	5	5
162.	Bichhauchh	76.498	26.433	Banas_Morel_065_RJ2901_AL	1	5	5
163.	Bichhauchh	76.491	26.429	Banas_Morel_065_RJ2901_AL	1	5	5
164.	Bichhauchh	76.489	26.433	Banas_Morel_065_RJ2901_AL	1	5	5
165.	Bichhauchh	76.485	26.438	Banas_Morel_065_RJ2901_AL	1	5	5
166.	Batoda	76.503	26.367	Banas_Morel_065_RJ2901_AL	1	5	5
167.	Batoda	76.507	26.370	Banas_Morel_065_RJ2901_AL	1	5	5
168.	Batoda	76.509	26.376	Banas_Morel_065_RJ2901_AL	1	5	5
169.	Bhawar	76.501	26.382	Banas_Morel_065_RJ2901_AL	1	5	5

170.	Bhawar	76.508	26.381	Banas_Morel_065_RJ2901_AL	1	5	5
171.	Batoda	76.521	26.363	Banas_Morel_065_RJ2901_AL	1	5	5
172.	Bhawar	76.513	26.387	Banas_Morel_065_RJ2901_AL	1	5	5
173.	Bhawar	76.516	26.385	Banas_Morel_065_RJ2901_AL	1	5	5
174.	Bhawar	76.514	26.391	Banas_Morel_065_RJ2901_AL	1	5	5
175.	Bhawar	76.518	26.391	Banas_Morel_065_RJ2901_AL	1	5	5
176.	Bhawar	76.516	26.395	Banas_Morel_065_RJ2901_AL	1	5	5
177.	Bhawar	76.520	26.397	Banas_Morel_065_RJ2901_AL	1	5	5
178.	Bhawar	76.526	26.393	Banas_Morel_065_RJ2901_AL	1	5	5
179.	Jeewad	76.526	26.388	Banas_Morel_065_RJ2901_AL	1	5	5
180.	Binjari	76.542	26.426	Banas_Morel_065_RJ2901_AL	1	5	5
181.	Phulwara	76.532	26.412	Banas_Morel_065_RJ2901_AL	1	5	5
182.	Phulwara	76.530	26.404	Banas_Morel_065_RJ2901_AL	1	5	5
183.	Barh Govindpura	76.540	26.407	Banas_Morel_065_RJ2901_AL	1	5	5
184.	Jakholas Kalan	76.550	26.406	Banas_Morel_065_RJ2901_AL	1	5	5
185.	Jakholas Khurd	76.556	26.408	Banas_Morel_065_RJ2901_AL	1	5	5
186.	Barh Phulwara	76.554	26.412	Banas_Morel_065_RJ2901_AL	1	5	5
187.	Barh Phulwara	76.566	26.416	Banas_Morel_065_RJ2901_AL	1	5	5
188.	Jakholas Khurd	76.554	26.403	Banas_Morel_065_RJ2901_AL	1	5	5
189.	Jakholas Kalan	76.549	26.397	Banas_Morel_065_RJ2901_AL	1	5	5
190.	Jakholas Kalan	76.552	26.395	Banas_Morel_065_RJ2901_AL	1	5	5
191.	Jakholas Kalan	76.554	26.394	Banas_Morel_065_RJ2901_AL	1	5	5
192.	Jakholas Kalan	76.553	26.390	Banas_Morel_065_RJ2901_AL	1	5	5
193.	Jakholas Kalan	76.551	26.390	Banas_Morel_065_RJ2901_AL	1	5	5
194.	Jeewad	76.545	26.386	Banas_Morel_065_RJ2901_AL	1	5	5
195.	Jeewad	76.533	26.390	Banas_Morel_065_RJ2901_AL	1	5	5
196.	Jeewad	76.548	26.376	Banas_Morel_065_RJ2901_AL	1	5	5
197.	Jeewad	76.549	26.370	Banas_Morel_065_RJ2901_AL	1	5	5
198.	Jeewad	76.541	26.363	Banas_Morel_065_RJ2901_AL	1	5	5
199.	Jeewad	76.538	26.364	Banas_Morel_065_RJ2901_AL	1	5	5
200.	Bhinora	76.527	26.356	Banas_Morel_065_RJ2901_AL	1	5	5
201.	Batoda	76.508	26.359	Banas_Morel_065_RJ2901_AL	1	5	5
202.	Kazi Kundli	76.503	26.348	Banas_Morel_065_RJ2901_AL	1	5	5
203.	Barh Jharoda	76.520	26.347	Banas_Morel_065_RJ2901_AL	1	5	5
204.	Jharoda	76.537	26.341	Banas_Morel_065_RJ2901_AL	1	5	5
205.	Barh Mohanpur	76.537	26.442	Banas_Morel_065_RJ2901_AL	1	5	5
206.	Goojar Theekariya	76.543	26.436	Banas_Morel_065_RJ2901_AL	1	5	5
207.	Barh Sancholi	76.454	26.431	Banas_Morel_067_RJ2901_AL	1	5	5
208.	Barh Sancholi	76.446	26.432	Banas_Morel_067_RJ2901_AL	1	5	5
209.	Mahrawand	76.443	26.430	Banas_Morel_067_RJ2901_AL	1	5	5
210.	Mahrawand	76.436	26.427	Banas_Morel_067_RJ2901_AL	1	5	5

211.	Chak Udairampura	76.432	26.423	Banas_Morel_067_RJ2901_AL	1	5	5
212.	Chak Udairampura	76.431	26.420	Banas_Morel_067_RJ2901_AL	1	5	5
213.	Madhopura	76.433	26.413	Banas_Morel_067_RJ2901_AL	1	5	5
214.	Arpura	76.448	26.419	Banas_Morel_067_RJ2901_AL	1	5	5
215.	Barh Sundri	76.457	26.420	Banas_Morel_067_RJ2901_AL	1	5	5
216.	Sundri	76.454	26.414	Banas_Morel_067_RJ2901_AL	1	5	5
217.	Sundri	76.467	26.419	Banas_Morel_067_RJ2901_AL	1	5	5
218.	Sundri	76.468	26.425	Banas_Morel_067_RJ2901_AL	1	5	5
219.	Bichhauchh	76.481	26.428	Banas_Morel_067_RJ2901_AL	1	5	5
220.	Sundri	76.481	26.424	Banas_Morel_067_RJ2901_AL	1	5	5
221.	Sundri	76.475	26.414	Banas_Morel_067_RJ2901_AL	1	5	5
222.	Sukhanandpur a	76.434	26.395	Banas_Morel_067_RJ2901_AL	1	5	5
223.	Sukhanandpur a	76.442	26.395	Banas_Morel_067_RJ2901_AL	1	5	5
224.	Sukhanandpur a	76.440	26.405	Banas_Morel_067_RJ2901_AL	1	5	5
225.	Tigriya	76.440	26.385	Banas_Morel_067_RJ2901_AL	1	5	5
226.	Tigriya	76.450	26.375	Banas_Morel_067_RJ2901_AL	1	5	5
227.	Berkhandi	76.453	26.367	Banas_Morel_067_RJ2901_AL	1	5	5
228.	Berkhandi	76.460	26.369	Banas_Morel_067_RJ2901_AL	1	5	5
229.	Barnala	76.469	26.382	Banas_Morel_067_RJ2901_AL	1	5	5
230.	Barnala	76.470	26.385	Banas_Morel_067_RJ2901_AL	1	5	5
231.	Barnala	76.463	26.391	Banas_Morel_067_RJ2901_AL	1	5	5
232.	Sundri	76.474	26.407	Banas_Morel_067_RJ2901_AL	1	5	5
233.	Meena Theekri	76.477	26.407	Banas_Morel_067_RJ2901_AL	1	5	5
234.	Meena Theekri	76.486	26.404	Banas_Morel_067_RJ2901_AL	1	5	5
235.	Meena Theekri	76.491	26.403	Banas_Morel_067_RJ2901_AL	1	5	5
236.	Barnala	76.494	26.401	Banas_Morel_067_RJ2901_AL	1	5	5
237.	Barnala	76.495	26.392	Banas_Morel_067_RJ2901_AL	1	5	5
238.	Barnala	76.487	26.391	Banas_Morel_067_RJ2901_AL	1	5	5
239.	Barnala	76.487	26.381	Banas_Morel_067_RJ2901_AL	1	5	5
240.	Berkhandi	76.487	26.366	Banas_Morel_067_RJ2901_AL	1	5	5
241.	Berkhandi	76.475	26.365	Banas_Morel_067_RJ2901_AL	1	5	5
242.	Barnala	76.463	26.402	Banas_Morel_067_RJ2901_AL	1	5	5
243.	Barh Goth	76.479	26.349	Banas_Morel_067_RJ2901_AL	1	5	5
					243		1215

Fig: 1: Tentative location of Recharge Shaft



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 100 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. 14.963 cr. 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).

Table 4: 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 – 12.15	-	1.50

Table 5: 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
Recharge Structures/ Activities						
Recharge shaft within the pond /tanks	Alluvium – Depth 80m, Dia: 10-12” with filter pit	243	8.52	5	1215	6.82
	Hard rock: Depth –60m, Dia 10-12”with filter pit	-	-	-	-	-
Percolation tanks (3 fillings)	200m*200m*1.5 m	-	-	-	-	-
Water Conservation Measures	Sprinkler Irrigation	300 ha	25	0.5/ha	150	0.24
		Total			1365	7.06
Impact assessment & Monitoring						
Piezometer	50 – 80 m	100		0.6	60	
<i>Impact assessment will be carried out by implementing agency</i>						
O & M - 5% of total cost of the scheme					71.25	
TOTAL					1496.25	7.06

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