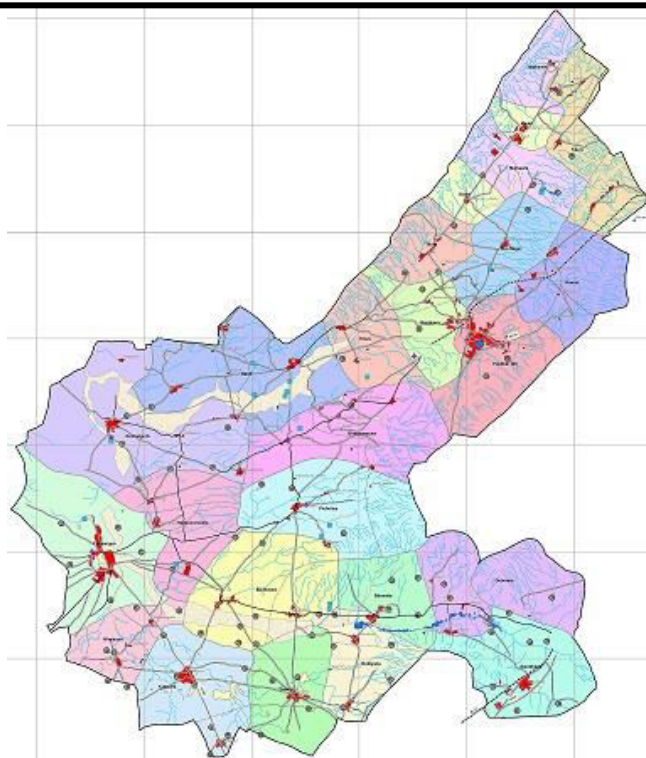**GOVERNMENT OF RAJASTHAN**
GROUND WATER DEPARTMENT

Success Story of various activities assigned for Peesangan Ground Water Cluster under RACP, District – Ajmer

(RAJASTHAN AGRICULTURAL COMPETITIVENESS PROJECT)

OFFICE OF THE SENIOR HYDROGEOLOGIST
GROUND WATER DEPARTMENT
AJMER

AJMER   **JANUARY 2020**

Contents

PROJECT BACKGROUND

Rajasthan is the most water deficient state in the country following short spell of monsoon coupled with erratic behavior and scanty rainfall. Keeping in view, Government of Rajasthan approved a project "RAJASTHAN AGRICULTURE COMPETITIVENESS PROJECT" (RACP) for which the investigation has been carried out.

The Rajasthan Agricultural Competitiveness Project Management & Implementation Society (RACP-MIS) has received credit of Rs. 832.50 Crore from World Bank towards the cost of the RACP and intends to apply part of the proceeds for consultancy services. Out of 17 clusters only Three (03) Ground Water clusters; Peesangan, Bonli & Sangod, were selected/identified under Ground Water theme for Planning and Implementation of Activities of Ground Water Sub - component as Part of Cluster Agricultural Competitiveness Plan (CACP) of Rajasthan Agricultural Competitiveness Project Management & Implementation Society (RACP-MIS).

PROJECT OBJECTIVE

The main objective of the Ground Water Cluster is to achieve sustainability of groundwater sources (i.e. aquifers); agricultural productivity enhancement; markets & value chains development; and building farmer organizations through community based approached with public support to reach a situation over a meaningful period of time in which the annual water extraction from the aquifer is limited to the annual ground water recharge. Achieving sustainability of groundwater sources are envisaged to take place through community-based approaches with public support striving to reach a situation over a meaningful period of time in which the annual water extraction from the aquifer is limited to the annual ground water recharge.

BRIEF DESCRIPTIONS OF PEESANGAN GROUND WATER CLUSTER

Peesangan Ground Water Cluster consist alluvium followed by Schist aquifer and covers an area of 31825 hectares in the Agro Ecological Zone (AEZ-IIIA) of Block Peesangan in Ajmer district. Project area falls within the 1:50,000 scale Survey of India topographic map-sheet 43G/6, 43G/7, 43G/10 and 43G/11 provided by the RACP and located in the NW of the district area and lies between 26°20'20'' to 26°28'30'' North Latitude and 74°17'20'' to 74°31' East longitude. The *Peesangan ground water cluster covers 44 villages falling in 22 Gram Panchayats* and one Town Pushkar. It is situated in the vicinity of Aravalli Mountain ranges and part of the Luni river basin and has seen to be at the verge of extinction under pressure of growing population & urbanization. The undulating topography, high wind velocity & varying intensity of rainfall are causing moderate to severe erosion in the area. The climate of the cluster area is semi-arid. The average annual rainfall (last 10 years from 2009-2018) is 530.46 mm and the soil texture is Sandy loam & loam. Total population of the cluster is 78886. Out of the total population, 51.50% are male and female are 48.50%. Scheduled caste (SC) and scheduled tribes (ST) are 19% of total population as per census 2011.

Location Map of Pisangan GW Cluster

Pisangan Groundwater Cluster under RACP Project, Ajmer, Raj.
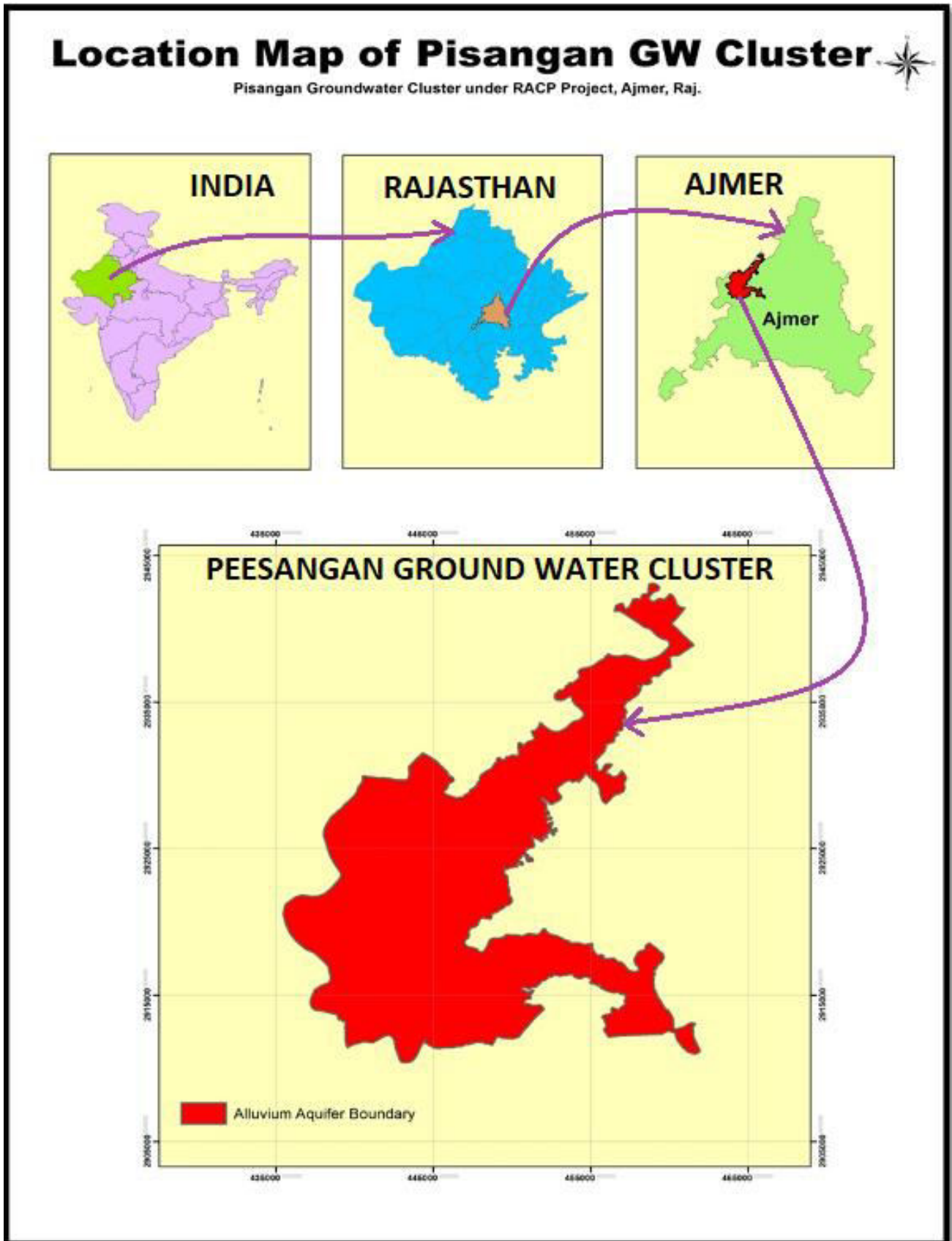
DETAILS OF VILLAGES FALLS UNDER THE CLUSTER

The Peesangan ground water cluster has been divided into 22 Gram panchayat. These Gram Panchayats are covering by 3 Tehsil (Peesangan, Pushkar & Ajmer) and 44 villages.

S.No.	Village	Gram Panchayat	Area in (Sq.Km)	Area in (Ha.)
1	Bhagwanpura	BHAGWANPURA	9.56	956.20
2	Motisar		3.31	331.00
3	Sawaipura		0.62	61.58
4	Surajkund,		6.01	601.19
5	Bhanwta	BHANWTA	10.68	1068.45
6	Hanwantpura	BHATSOORI	1.41	141.27
7	Nad		9.21	921.29
8	Budhwara	BUDHWARA	21.01	2101.43
9	Nooriyawas		6.08	608.07
10	Dantra	DANTRA	12.10	1210.37
11	Lyali Khera		4.67	467.14
12	Banseli	DEO NAGAR	4.11	410.96
13	Deo Nagar		5.99	598.99
14	Dodiyana	DODIYANA	9.15	915.30
15	Nathuthala		4.38	437.93
16	Amba Maseena	DOOMARA	5.71	570.96
17	Doomara		2.41	241.32
18	Chawandiya	GANAHERA	4.29	429.25
19	Ganahera		5.95	594.65
20	Govindgarh	GOVINDGARH	6.38	638.46
21	Jaswantpura		15.71	1570.70
22	Doongariya Khurd	KADEL	4.32	432.04
23	Kadel		1.11	110.56
24	Kalesara	KALESARA	19.83	1982.93
25	Sarsari		3.41	341.04
26	Kawalai	KHORI	2.34	234.33
27	Khori		3.19	319.39
28	Gudha	MAJHEWLA	2.90	289.52
29	Majhewla		3.21	320.64
30	Rewat		2.14	214.15
31	Miyapur	Miyapur	2.03	203.09
32	Leswa	NAND	13.36	1336.20
33	Nand		13.93	1392.75
34	Rampura Nand		3.52	351.82
35	Pisangan	PEESANGAN	20.25	2025.33
36	Picholiya	PICHOLIYA	16.80	1679.80
37	Pushkar (M)	PUSHKAR (M)	2.16	215.65
38	Pushkar (R)		2.19	218.89
39	Fatehpura	RAMPURA DABLA	1.90	189.54
40	Rampura Dabla		10.67	1067.32

S.No.	Village	Gram Panchayat	Area in (Sq.Km)	Area in (Ha.)
41	Sethan		8.30	830.44
42	Saradhana	SARADHANA	15.50	1549.78
43	Kishanpura Goyla	TILORA	11.91	1190.98
44	Tilora		4.52	452.24
Total			318.25	31824.96

ACTIVITY PERFORMED IN THE CLUSTER AREA

One dedicated Consultancy (Technical) Agency M/s. Arpan Seva Santhan, Udaipur for technical support and preparation & implementation of Ground Water Management Sub Plan has been deployed for Peesangan Ground Water Cluster under supervision of PIA. Since the department does not have sufficient manpower for conducting these activities, RACP engaged a Consultancy Agency in Peesangan Ground Water Cluster and declared PIA – Peesangan as their client. The consultancy agency deployed in the Peesangan Ground Water Cluster could not complete all the activities and deliver quality deliverables as per ToR in defined timeline, so decision were taken to terminate the agency & agency were terminated as on 23.01.2018 vide Project Director, RACP office letter no. 10800-807 dated 24.11.2017. In these circumstances, the Department with assistance of District Coordinator appointed by RACP took in-charge and completed the desired activities according to CACP.

Major activities performed in the Peesangan Ground Water Cluster are tabulated below;

S.N.	Activities	Details
1	Inception Report	Project Inception Report has been submitted by the consultancy agency.
2	Collection of relevant data.	All the relevant data has been collected from different department and the revenue data from the revenue department and accordingly GIS layers have been prepared.
	Data Base Creation on GIS Platform & Thematic layers	All the collected & field investigation data has been compiled on GIS platform by which analysis of data and preparation work of different thematic layers & Maps has been done.

3	Detailed Hydrogeological Investigation Survey (DHI)	DHI survey of 100% Water Extracting Units including dry wells has been completed. Approximate **5140** numbers of ground water extraction structures were registered in the cluster area on GIS platform.
4	Geophysical Investigation	The Geophysical Investigation data collected through geo-electric resistivity method.
	Demarcation & Delineation of Aquifer boundary	The proposed aquifer boundary has been delineated & demarcated by a multi-criterion decision making exercise. The area of final Aquifer of cluster has been computed as 31825.0 hectare.
5	GWMS Plan	Ground Water Management Sub Plan (GWMS Plan) has been prepared & submitted.
6	Ground Water Monitoring Network Established in the Cluster Area	Based on DHI survey/Geophysical survey and field observation, selection of monitoring network according to Grid basis was carried out. **78 nos. of Open-wells & 33 nos. of Piezometers** have been selected for regular monitoring of water level.
		The water sample has also been collected from the selected open-wells during pre-monsoon and post-monsoon periods for Ground water quality measures. Drinking water quality of the cluster area is likely to be Potable. Water quality refers to the chemical, physical, biological characteristics of water, although it is an on-going process & completed regularly. Apart from monitoring stations, to measure & monitor the ground water withdrawal and to understand the crop water requirement on farmer's field, 100 nos. of water meter have been installed.
7	Installation of telemetric Digital water level recorders (DWLR)	Total 32 Nos. of telemetric Digital water level recorders (DWLR) on selected Piezometers sites has been installed for continuous monitoring of water level and impact assessment of effective ground water management.
8	Ground Water Assessment	It involves the analysis of groundwater availability and the assessments of the hydrological balance and the time of residence. It also includes forecasting the future use of water resources based on various exploitation alternatives.
9	Farmer Organization & Capacity Building	Department have organized training / capacity building program at Gram Panchayat & Block level. So far 28 nos. of one day workshop at GP Level & 02 nos. at Panchayat Samiti level are organized. A five day exposure visit has been also organized with 50 farmers.

GROUND WATER MONITORING NETWORK

Groundwater monitoring programs are generally designed to measure changes in groundwater level over time, in either single or multiple aquifers. Initially detailed hydrogeological survey (DHI) of 100% of existing ground water extraction units i.e. dug wells/ dug cum bore wells/ open wells/ Baories/ bore wells/ tube wells etc. has been carried out in the Peesangan Ground Water Cluster. As per the Detailed Hydrogeological Survey, gaps and deficiencies have been identified on the basis of grid where no representative wells available. There are **total 78 nos. of Key-wells** have been finalized for regular monitoring of water level and **total 33 nos.** of piezometers has been identified and constructed for regular monitoring of water level. Appropriate Observation Wells sites on the basis of grid have been selected by using Geophysical techniques. Total **04 numbers** of Observation wells have been constructed. **Total 32 Nos.** of telemetric Digital water level recorders (DWLR) on selected Piezometer sites has been installed for continuous monitoring of water level and impact assessment of effective ground water management. To measure & monitor the ground water withdrawal and to understand the crop water requirement on farmer's field, **Total 100 nos.** of Water Meter have been installed. By using the water meter in conjunction with the basic calculations, the stockholder can determine if he is applying the correct amount of water to meet the crops daily need as well as the watering schedule for optimum crop production, while at the same time improving water conservation efforts. The water meter used for improved yields while conserving water.

The water sample has also been collected from the selected 78 nos. of key-wells during pre-monsoon and post-monsoon periods for Ground water quality measures. Water quality refers to the chemical, physical, biological characteristics of water, although it is an on-going process & completed regularly.

S.N.	Activities	Target	Achievement
1	Key-wells / Open Wells Selection	-	78
2	Piezometers Constructions	33	33
3	Observation well Constructions	04	04
4	T-DWLR Installation	33	32
5	Water Meter Installation	100	100

GROUND WATER ASSESSMENT

Ground Water Assessment involves analysis of Net Annual Ground Water Availability, Existing Gross Ground Water Draft, and the assessments of the hydrological balance. Ground Water Assessment forecasts the future availability of water resources based on GEC-2015 guidelines. Ground Water Assessment for the year 2018-19 shows the Stage of Ground Water extraction of the cluster area is 138.04 (%).

The actual impact assessment of the investment of supply side intervention will be replicated in every 2 years. Since the GW activities viz. Construction of Piezometers/Observation wells & Installation of Telemetric – DWLRs were completed in last 3 to 5 months of time; the impact on Ground water will be assessed in coming 2 to 3 years. Peesangan Ground Water Cluster is also classified under **"OVER EXPLOITED"** category.

FARMER ORGANISATION & CAPACITY BUILDING

Training & capacity building activities on sustainable water management & agricultural productivity enhancement were organized regularly to farmers groups and CBOs. The Ground Water Department district - Ajmer have regularly organizing training/capacity building programs at Village, Gram Panchayat & Block level under Information Education Communication (IEC). So far, 5 days exposure visit, 28 nos. of one day workshop at Gram Panchayat & Village Level & 02 nos. of one day workshop at Panchayat Samiti level have been organized. A five day exposure visit has been also organized with 50 farmers.

CONCLUSION

In the Preparation and Implementation of Activities under Ground Water Management Sub-Plan as a Part of Cluster Agricultural Competitiveness Plan (CACP) in Ground Water Clusters Bonli, Pisangan & Sangod and related activities; RACP engaged a Consultancy Agency in all three Ground Water Cluster and declared PIAs as their client, since the department does not have sufficient technical staff for conducting these activities. The Consultancy Agency deployed in the Ground Water clusters could not complete all the activities and deliver quality deliverables as per ToR in defined timeline, so decisions were taken to terminate the agency. In these circumstances, the Department with support of manpower appointed by RACP took efforts and completed the activities according to CACP.

As an outcome of Cluster Agriculture Competitiveness Plan (CACP), the awareness among the stakeholder have been increased through capacity building and Information Education Communication (IEC) activities carried out on different Levels in the cluster area. The traditional methods like flood irrigation etc. have been reduced, as a result the stakeholders are now utilizing the Ground Water Resources more judiciously and shifted on low water consumption crops by using new irrigation techniques (pressure irrigation) such as Drip irrigation, Sprinklers irrigation etc. increasing the unused cultivable land which benefited farmers to get more rupees per unit of water in compensation for farmers using fewer units of water. Although, there is significant change observed in the improvement of Ground Water Resources in Peesangan GW Cluster area.

The activities like Construction of Piezometer /Observation wells and Installation of TDWLRs have been completed and to measure & monitor the ground water withdrawal and to understand the crop water requirement on farmer's field, 100 nos. of water meter have been installed, apart from these activities, Roof Top Rain Water Harvesting, Farm Ponds, Rejuvenation of Traditional Water Bodies (Step wells, Baories), Recharge through abandoned Tube Well/HP/Dug Wells, Recharge Shafts in the Existing Ponds etc. should also be taken up for implementation and improvement of Ground Water Resources in Peesangan GW Cluster area.

The actual impact assessment of the investment of supply side intervention will be replicated in every 2 years. Since the GW activities viz. Construction of Piezometers/Observation wells & Installation of Telemetric – DWLRs were completed in last 3 to 5 months of time; the impact on Ground water will be assessed in coming 2 to 3 years.

GWD Office and Cluster area visited by World Bank Team

Cluster area visiting by World Bank Team

Exposure visit along with farmers within state

DHI Survey Well Data Capturing

DHI Survey Farmer Discussion

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Drilling RIG setup

After Drilling completion

TDWLR Installation

Newly Drilled Pz

Pz Platform, Sign Board installation

Thanks