Government of Rajasthan

Rajasthan Agricultural Competitiveness Project (RACP)

Operational Guidelines

For

PLANNING AND IMPLEMENTATION OF GROUND WATER MANAGEMENT SUB PLAN UNDER CLUSTER AGRICULTURE COMPETITIVENESS PLAN (CACP)

In

GROUND WATER CLUSTERS

APRIL, 2016

Prepared By

PMU-RACP

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**Ground water Cluster:** Pisangan District Ajmer, Bonli District Sawai-Madhopur, Sangod District Kota

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<td>AAP</td>
<td>Annual Action Plan</td>
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<td>Agri-Business Promotion Facility</td>
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<td>AEZ</td>
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<td>Cluster Agricultural Competitiveness Plan</td>
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<td>CBO</td>
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<td>Farmer Field Schools</td>
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<td>GB</td>
<td>General body</td>
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<td>GIS</td>
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<td>HMN</td>
<td>Hydrological Monitoring Network</td>
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<td>IB</td>
<td>Individual Beneficiary</td>
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<td>IEC</td>
<td>Information, Education and Communication</td>
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<td>IMTI</td>
<td>Irrigation Management Training Institute</td>
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<td>Interim Unaudited Financial Reports</td>
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<td>ISRO</td>
<td>Indian Space Research Organisation</td>
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<td>KPI</td>
<td>Key Performance Indicator</td>
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<td>KVK</td>
<td>Krishi Vigyan Kendra</td>
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<td>LFA</td>
<td>Logical Framework Analysis</td>
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<td>LR</td>
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<td>LU &amp; LC</td>
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<td>M &amp; E</td>
<td>Monitoring and Evaluation</td>
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<td>MB</td>
<td>Measurement Book</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<td>MGNREGS</td>
<td>Mahatma Gandhi National Rural Employment Guarantee Scheme</td>
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<td>MIS</td>
<td>Management Information System</td>
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<td>Memorandum of Understanding</td>
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<td>Multi Task Group</td>
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<td>Non-Government Organisation</td>
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<td>PCR</td>
<td>Project Completion Report</td>
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<td>PDO</td>
<td>Project Development Objective</td>
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<td>Project Implementation Unit</td>
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<td>PMU</td>
<td>Project Management Unit</td>
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<td>PIA</td>
<td>Project Implementation Agency</td>
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<td>PRA</td>
<td>Participatory Rural Appraisal</td>
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<td>PRI</td>
<td>Panchayat Raj Institution</td>
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<td>R&amp;D</td>
<td>Research and Development</td>
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<td>RACP</td>
<td>Rajasthan Agricultural Competitiveness Project</td>
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<td>RACPMIS</td>
<td>Rajasthan Agricultural Competitiveness Project Management &amp; Implementation Society</td>
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<td>RAJUVAS</td>
<td>Rajasthan University of Animal and Veterinary Sciences</td>
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<td>Steering Committee</td>
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<td>Sampoorna Grameen Rozgar Yojana</td>
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<td>SIAM</td>
<td>State Institute of Agriculture Management</td>
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<td>TNA</td>
<td>Training Needs Assessment</td>
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<td>Technical Review Committee</td>
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Chapter-1
Institutional Arrangements

I. Background:
A. The Rajasthan Agricultural Competitiveness Project Management & Implementation Society (RACPMIS) has been receiving credit from the World Bank towards the cost of Rajasthan Agricultural Competitiveness Project. The core objective of Rajasthan Agricultural Competitiveness Project (RACP) is to achieve sustainable water resources management practices within agriculture.

B. Project Development Objective (PDO) of RACP is to establish the feasibility of sustainably increasing agricultural productivity and farmer incomes through a distinct agricultural development approach by integrating agriculture water management & agricultural technology, farmer organizations & market innovations in selected locations across ten agro-ecological zones of Rajasthan. The aim for the state is to help farmers to get more rupees per unit of water in compensation for farmers using fewer units of water.

C. The guiding principles under the project are: (a) sustainable and efficient use of water resources, including improved on-farm water use efficiency, reduced water-intensive cropping patterns, and using the resultant savings of water from agriculture sector for economic purposes outside of agriculture in support the state’s water policy objectives; (b) increased private sector participation in the development of value chains in processing and marketing in support of the state’s agro-processing and agri-business policy; and (c) improved public sector capacity in delivering agriculture support services.

D. Key performance indicators (KPIs) will measure (a) reduction in water used in agriculture; (b) increase in water use efficiency in agriculture; (c) increase in agricultural productivity; (d) increase in gross margins from crops and livestock products; (e) increase in the share of producer price in wholesale price; and (e) farmer satisfaction with project deliverables.

E. The RACP has four components: Component 1: Climate Resilient Agriculture; Component 2: Markets and Value Chains; Component 3: Farmer Organization and Capacity Building; and Component 4: Project Management, Monitoring and Learning.

II. Implementation arrangement for preparation & implementation of CACP:
The implementation arrangements for the project cover issues related to governance structures for the project, coordination between various implementation partners, particularly representation and participation of the six line departments (namely Department of Agriculture, Horticulture, Animal Husbandry, Water Resources (Canal), Groundwater, and Rural Development (Watershed)), fund flow and fiduciary systems, and finally project implementation, specifically at the cluster level for the CACPs. The implementation structure described below follows the state, district, cluster and community level implementation and monitoring arrangements.

A. State level:
The project will be implemented through a State Project Management Unit (PMU) established under a newly registered society namely RACP Management and Implementation Society (RACP MIS) which has been specifically set up for the RACP. To have an effective
coordination and to provide a robust governance and coordination mechanism for the project, the Government of Rajasthan has constituted two state level committees i.e., RACP Management and Implementation Society General Body (RACP MIS) and RACP Executive Committee (EC).

1. **RACP Management and Implementation Society (RACPMIS):**
   
   Steering Committee of RACPMIS at the State level is set up under the chairmanship of Chief Secretary, Govt. of Rajasthan. Additional Chief Secretaries/Principal Secretaries of participating Line Departments, Principal Secretary Finance, Planning & Veterinary University, representatives of Industry, Farmers & Social sector are the members. This society will meet once in six months to give overall advice, policy directives for smooth implementation and monitoring of project implementation. The key role of Steering Committee is to ensure a coordinated approach across different Line Departments and stakeholders. The Committee has power to approve need based changes in design, budget & administrative issues involved in the implementation of RACP. The Project Director, RACPMIS is the Member Secretary of this Committee.

2. **RACP Executive Committee (EC):**
   
   Executive Committee of RACPMIS is constituted under the chairmanship of Additional Chief Secretary, Agriculture, Government of Rajasthan and the Head of the Departments of the participating line department as members and Project Director, RACPMIS as the Member Secretary of this Committee.

   The above committee will perform following activities –

   i. Oversee efficient execution of the RACP activities.
   
   ii. Monitoring of physical & financial targets and achievement, its compilation at state level.
   
   iii. Review of progress reports, impact assessment, documents & approach and report to the Steering Committee.
   

3. **Project Management Unit (PMU):**
   
   Project Management Unit (PMU) headed by a Project Director, RACP has been established for the purpose of implementation of the project. The PMU will be housed in the RACP Society and shall be overall responsible for the implementation and day to day co-ordination of RACP including responsibility for overall financial management, central level procurement, safeguards, M & E, supervision of CACPs and other backstopping arrangements. The PMU will be staffed by a team of professional staff and support staff, including a Chief Financial Controller, Procurement specialist, M&E and MIS specialists, Social and Environment specialists, Agri-business specialist and five other technical personnel. In addition, the PMU will have deputed to it six representatives of the participating line departments who will be the Coordinators for the components for which their parent line departments are responsible.

4. **Project Implementation Unit (PIU):**

   The RACP involves the participation of six line departments, viz. Agriculture, Horticulture, Animal Husbandry, Water Resources (Canal), Ground Water, and Watershed Development and
Soil Conservation (within Rural Development). A small Project Implementation Unit (PIU) headed by a Nodal Officer of the Line Department is established in all the line departments and these PIUs will coordinate with the Line Departments and RACP-PMU. The respective PIU will function under the overall guidance and control of the respective head of the department and coordinate closely with the PMU and oversee field level planning and implementation of Ground water Sub Component activities in RACP.

Nodal Officers of RACP working in the Line Departments shall be responsible mainly for:

i. Facilitating & extending technical support/input, apart from providing requisite information for identified clusters time to time as desired by the PMU.

ii. Ensure timely preparation of Sub plans, Annual Action plans, DPRs etc.

iii. Review/monitor the progress of RACP works/activities in the cluster as per project guidelines during his/her field visits. They may take the support of district / Panchayat level officers of concerning line department and suggest any improvement in works/program being implemented under intimation to PMU.

iv. Participation in Quarterly/monthly review meetings of Nodal officers at the level of PMU.

v. Participate in the workshops / exposure visits organized under RACP.

5. **Partner Agencies:**

5.1 Roles & responsibilities of Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), Bikaner: The details are covered in the Livestock Operational Guidelines.

5.2 Roles and responsibilities of Association for Rural Advancement through Voluntary Action & Local Involvement (ARAVALI), Jaipur:

i. ARAVALI is registered as a society under Rajasthan Societies Act, 1958, under Foreign Contribution Regulation Act & under relevant Income Tax Acts, as applicable.

ii. ARAVALI shall act as Partner Agency (PA) to RACPMIS and support the project in execution & implementation of activities & for this ARAVALI will establish an exclusive ARAVALI-RACP-UNIT at its headquarters at Jaipur.

iii. ARAVALI shall conduct various training & capacity building programs based on following four specific domains;

   a. RACP Specific Orientation Training Programs
   b. Human Behavior Trainings
   c. Management Development and Group Dynamics Programs
   d. Orientation Programs for NGO & Consultancy Agency

iv. ARAVALI shall undertake following task responsibilities under RACP:

   a. Conducting Orientation of all RACP stakeholders about Project objectives, interventions planned various components of project and other aspects of the RACP.

   The Orientation program for the RACP stakeholders / Project implementing agencies with focus on:

   (i) Objectives of the RACP project
   (ii) Institutional arrangements (Implementation guidelines)
   (iii) Program implementation structure at various levels (Cluster, District & State)
(iv) Role of implementation agencies for executing RACP project

   (i) Training programs on human behavior, inter-personal skills, community cooperation and group dynamics and related aspects of the Community and Farmers groups.

c. Backstopping support services for NGO & Consultancy Agency

d. Conducting capacity building & training programs for NGO & Consultancy Agency covering following areas:
   (i) Orientation of NGO & Consultancy Agency about RACP project.
   (ii) Capacity building programs for community mobilization processes, methodology & tools.
   (iii) Regular training support on village level institutions (Farmers groups, user based groups, water user association etc.)

e. Development of Knowledge Resources, Extension Materials Field & Operational Manuals for training & capacity building programs with respect to specific domains.

f. Conducting Peer Learning exercises (sharing of experience gained during implementation) with RACP stakeholders for the project.

v. Capacity Need Assessment would be undertaken by the ARAVALI at the cluster level in consultation with PIA/NGO & Consultancy Agency in order to assess the support requirement for capacity building, trainings & skill development. ARAVALI will design customized modules based on need assessment.

vi. ARAVALI will facilitate on-site-cluster-based-trainings (CBTs) through NGO focusing on farmer’s mobilization and other necessary capacities including knowledge, skills and attitude augmenting effective execution of the project.

vii. ARAVALI will conduct extension training programs as per need assessment for strengthening existing extension methodologies in consultation with RACP-PMU.

viii. ARAVALI will provide training on Farmer Field Schools (FFS) based on FAO (Food and Agriculture Organization) approach for both crops and livestock.

B. District level:

1. District Project Management Units (DPMUs):

   At the district level, Dy. Director, Agriculture cum Project Director (ATMA) has been designated as the ex-officio District Project Management Unit (DPMU) for RACP to handle the management of the NGO hired by the RACP. He will be responsible for all matters related to coordination among the district level officers of the lines departments in day to day working, implementation of RACP activities etc. He is the Member Secretary of the DLIC, therefore, he will ensure time organisation of meetings of the DLIC. He will also monitor the activities of the cluster level NGO who will be deployed for the activities like Community Mobilization, IEC, Group formation and technical support. The DPMU/PIA/PMU will also primarily be responsible for the financing of all the activities undertaken by the NGO at the field level.
Roles and Responsibilities:-

➢ To undertake procurement activities and strengthening the infrastructure and financial management for smooth functioning of the project work.

➢ Monitoring of the services rendered by the NGO and to coordinate with them in preparation of CACPs and their implementation.

➢ Supervise and monitor the development of the project components undertaken by the NGO.

➢ Appraises the DLIC program prepared and implemented quarterly

➢ Prepare annual procurement plan of sub component responsible by the NGO at cluster level, get approval of DLIC and submit to PMU.

➢ Call for the tenders; finalize the tender with the participation of the implementing agencies as per the World Bank guidelines and which will be issued from time to time in this behalf by the World Bank.

➢ Arrange for goods and services to NGO as per CACP.

➢ Prepare and submit monthly, quarterly, six monthly and annual reports on Physical and financial progress of the project facilitated by NGO.

➢ At least 25% test check of all the activities undertaken by NGO in a cluster is mandatory for DPM of respective cluster.

➢ To find out training needs and organize the training camps or capacity building of the stakeholders.

➢ Ensure women participation and empowerment in cluster activities

➢ Help organize capacity building of NGO through Arraval.

➢ To consolidate the progress and suggestions and feedback of the project activities and to report to the state level Executive Committee and prepare success stories at cluster level.

➢ The components/interventions of the project at cluster level will be implemented by NGO under the direction of DPMU.

➢ Carry out functions as directed by PMU,RACP

2. Project Implementation Unit (PIA) for Pisangan, Sangod and Bonli Ground Water Cluster:-

At the district level, Senior Hydrogeologist, Ajmer, Kota and Jaipur will be declared as in charge for PIA Pisangan, Sangod and Bonli Ground Water Cluster respectively to handle the management of the Consultancy Agency hired by the Ground Water Department for RACP works. PIA will be responsible for all financial functions at the cluster level and be the basic accounting unit of the project. PIA will primarily be responsible to coordinate all the activities undertaken in day to day working, implementation of RACP activities on technical aspects etc.
by the Consultancy Agency at the field level and IEC, Community mobilization for formation of Community Base Organizations and all other different department’s activities by NGO hired by RACP. PIA will be provided one District Coordinator (Ground Water) from the RACP to monitor and supervise the cluster level activities of Ground Water Sub Plan. The Roles and Responsibilities of the PIA are as under:

**Roles and Responsibilities:**

- To undertake procurement activities and strengthening the infrastructure and financial management for smooth functioning of the project work.
- Monitoring of the services rendered by the Consultancy Agency and to coordinate with them in preparation of Ground Water Management Sub Plan and their implementation.
- Supervise and monitor the development of the project components undertaken by the Consultancy Agency.
- Prepare annual procurement plan of sub component responsible by the Consultancy Agency at cluster level, get approval of DLIC and submit to PIU for onward transmission to PMU.
- Assist PIU for calling the tenders; finalize the tender with the participation of the implementing agencies as per the World Bank guidelines and which will be issued from time to time in this behalf by the World Bank.
- Arrange for goods and services to Consultancy Agency as per Ground Water Management Sub Plan.
- Prepare and submit monthly, quarterly, six monthly and annual reports on Physical and financial progress of the project facilitated by Consultancy Agency.
- At least 25% test check of all the activities undertaken by Consultancy Agency in a cluster is mandatory for In-Charge PIA of respective cluster.
- District Coordinator will be responsible for verification of all the activities related to ground water sub plan undertaken by field agency including NGO in a respective cluster. The works executed by field agencies including NGO will also be monitored by the GWMA, In-charge of respective Cluster & Project Director (ATMA) as per the norms decided in operational guidelines of the project.
- Check and verify all activities undertaken by field agency in Measurement Books.
- To find out training needs for departmental officers stake holders.
- Ensure women participation and empowerment in cluster activities
- Help organize capacity building of Consultancy Agency through Aravalli.
- To consolidate the progress and suggestions and feedback of the project activities and to report to the PIU and prepare success stories at cluster level.
- The components/interventions of the project at cluster level will be implemented by Consultancy Agency under the direction of respective PIA/PIU.
- Also carry out all other activities as directed by PMU-RACP.
3. **District-Level Implementation Committee (DLIC):**

For ensuring coordination of RACP activities at the district level and to review progress of CACP implementation, a DLIC, headed by the District Collector with District Project Manager (DPM) as member secretary is established. DLIC will have district level officers of the participating line departments as the members. DLIC will also maintain convergence at district / zilla parishad level to Panchayat Raj Institutions (PRIs) at block & Gram Panchayat (GP) level. The linkage between the PRIs & the project is critical so that no conflict situation arises between the PRIs and different CBOs set up within the RACP.

**Functions:**

i. Overall supervision and oversight of the activities of CACP.

ii. Coordination of RACP activities at cluster level among the line departments.

iii. Support convergence with Govt. schemes like RKVY, NFSM, NHM, RRLP, and MGNREGS.

iv. To find out training needs, organize training camps or capacity building of stakeholders.

v. Ensure Coordination with PRIs, line departments at district, block, and Gram Panchayat level.

vi. To find out the constraints and their remedies to enhance the impact of agricultural competitiveness activities in the selected clusters.

vii. To find out the bottlenecks in implementation of CACPs and to suggest their remedies.

C. **Cluster level:**

1. **Consultancy Agency:**

The project envisages that planning and implementation of Ground water sub plan as part of CACP will be carried out by the Consultancy Agency with the support of the local community/Community Based Organisations and supported by the team of different subject specialist under the close monitoring, guidance and supervision of the PIA of respective Clusters/PIU-GWD and PMU.

2. **Non-Government Organization (NGO):**

The activities like Community Mobilization, IEC, Group formation, Demand Management activities etc. as part of Ground water Management Sub Plan would be carried out by the NGO with the team of different subject specialist under close guidance and supervision of DPMU and PMU.

3. **Community Based Organizations(CBOs):**

   (i) **Ground Water Management Association (GWMA):**

   GWMA would be formed at the cluster level on federations of Ground Water management Committees (GWMCs) to manage and regulate the sustainability of the ground water at the aquifer level and it is a Registered Body under Society Act-1958. These would further strengthen & activate the linkages established with external resource agencies for
knowledge, credit, input procurement, sale of local produce, carrying on processing activities to the point of exports etc. In these activities, bankability of the activities will be attempted. These GWMA shall have major role in supervising & coordinating marketing & value chain activities in the cluster.

D. Gram Panchayat (GP) Level

(i) **Ground Water Management Committees (GWMCs):**

NGO in consultation with the PIA will form the Ground Water management Committees (GWMCs) at Gram Panchayat level by federating Multi Task Groups (MTGs) formed at the village level. It is a Registered Body under Society Act-1958 & will have its own bye-laws. General Body of MTA shall comprise of all Leaders & Co-Leaders. Each GWMC, with the support of NGO will have one Community Resource Person (CRP), who will work as office secretary of GWMC. GWMC with technical support from Consultancy Agency will implement the physical activities (both related to demand and supply side).

E. Village Level

(i) **Multi Tasks Group (MTG):**

NGO will form Multi Task Groups (MTGs) by motivating & involving 10-15 (Ten to Fifteen) adjoining ground water utilizing farmers and will be grouped to form one Multi task group. NGO will mark the location and area defined by individual MTGs formed on Khasra map of village and give a name/number to each MTG. MTG will be responsible for implementation of all activities at the field level related to ground water, agriculture, horticulture, livestock, marketing, value chain etc. The beneficiary of the MTGs should be willing to pay upfront beneficiaries contribution in the form of cash/labor/material. The MTGs will carry out work in their own fields by arranging labors or as directed by PIA/PIU/PMU from time to time. Assistance from the project for individual activities will be directly transferred from PIA/PIU/PMU into the bank account of concerning members of MTG. For this, procedure will be specified by the PMU, RACP.

(ii) **Multi Tasks Group (MTG) for landless farmers having small ruminant:**

NGO will form Separate MTGs at Village level for the category of landless farmers having small ruminant.
Organizational Chart for Ground Water Cluster under RACP

**RACP-PMU**

**District Level Implementation Committee (DLIC)**

**DPMU**

**Project Implementation Unit (PIU)**

**Consultancy Agency**

**Team of Consultancy Agency**

- Team leader
- Hydro-geologist
- Geophysicist
- GIS Expert
- Water Resource Expert
- Surveyor
- Office Assistant

**Ground Water Management Committee (GWMC)**

At Gram Panchayat level

**Ground Water Multi Task Groups (GWMTGs)**

These groups comprises 10-15 ground water user farmers at Village level

**Non Government Organization (NGO) hired by RACP**

**Ground Water Management Association (GWMA)**

At Cluster (aquifer) level

**Project Implementation Agency (PIA), Pisangan, Sangod & Bonli**
Chapter-2

Ground Water Sub Component

Component 1: Climate Resilient Agriculture (1A: Improving Water Use Efficiency)

A. Background:

Groundwater continues to be considered as a private and individual resource. Its development is mostly by individual or group of farmers with their own financial resources or with loans from financial institutions/banks and the Government provides financial support mainly through partially subsidized energy supply. Despite various I.E.C. efforts by the GoR, excessive withdrawal of groundwater continues which has resulted in regional imbalance and inequity amongst users. This has destabilized the aquifer system and resulted in unsustainable development. **Indiscriminate ground water development has led to substantial ground water level declines both in hard rocks and alluvial areas threatening sustainability of this resource.**

Considering the limitations of present groundwater management system, there is a need to develop a **new groundwater management model** that recognizes limitations of existing management system by individual. Groundwater occurs in an aquifer which has its own natural boundaries and does not necessarily follow the geographical boundaries like Administrative unit. Groundwater occurrence and movement are not limited to individual land holdings. Therefore, sustainable groundwater management system has to recognize an aquifer as a groundwater unit. The sustainable development and management of groundwater resources in an aquifer could be achieved through community participation. For this, all primary stakeholders in an aquifer have to collectively manage the groundwater resources through prioritize utilization of groundwater by different sectors like drinking water, agriculture, and industry, and allocate the available resources to each user sector for sustainable development. **This requires regulating the demand particularly for agriculture sector.**

In view of the state’s needs, the **Community Based Aquifer Level Groundwater Management Model** under RACP would be developed which recognizes limitations of existing management system by individual and recommends an aquifer level groundwater management by the community. It is envisaged that objective of Model would be:-

B. Objective:

i. Community driven institutional Model to develop and test groundwater management approaches in an aquifer representing different groundwater utilization situations by the community (concerned stakeholder of Ground Water) as well as acceptability by the community.

ii. Information Education and Communication (IEC) campaign to create awareness of emerging problems and generate support from all stakeholders for groundwater management options to solve the identified problems.

iii. Strengthening of community to develop scientific data base and enhance their analytical skills and technical capabilities essential to monitor groundwater conditions and understand
the viability of various potential management options for sustainable groundwater management in an aquifer

iv. Take up activities that would provide insight to key issues of groundwater management, options for legal framework and supporting regulations as an initiative for sustainable groundwater management.

C. Component Design and Eligible Investments:

The following activities are envisaged for effective completion of tasks to be accomplished of the Ground Water Sub Component as part of CACP.

C.1 Social Assessment: As a first step towards developing an approach and plan for a community based groundwater management, it is essential to understand the ground situation with regard to supply and demand of groundwater, initiatives at the community level, and how the community could be involved to address these issues. For this purpose it is essential to carry out a detailed Social Assessment (SA) in the cluster area. The main aim of the exercise would be to identify the social issues associated with the proposed approach of community based groundwater management, understand its ramifications and problems. The results of the social assessment will form the basis to develop a strategy to involve local communities in the overall planning, implementing (including operation and maintenance of structures and management systems developed), and monitoring the project activity under the groundwater cluster. This will be done mainly through informed participation.

Further, the strategy to be prepared as part of SA process, will provide input for formulating policy to regulate groundwater in the State and enhance the participation of various stakeholders in the program and ensure that such a regulation will meet the genuine needs of groundwater of all the stakeholders.

The Social Assessment is intended to develop a framework to assess the potential socio-economic issues associated with the project activity; consultation with a variety of stakeholders; examine the legal, policy and institutional aspects to ensure adequate and effective stakeholder group formation, management, and functioning that is central to the community-based approach of the pilot activity. Output of the study include a framework for economically and socially-sustainable groundwater development, management and regulation at the community level which would include inter alia: (i) participation and consultation strategy, (ii) baseline information and a monitoring strategy, (iii) an Action Plan for community based groundwater management, (iv) identify any adverse impact of the project component and prepare an action plan to mitigate adverse impacts, wherever needed, for the water resources sector and (vi) develop a strategy and an Action Plan to address issues concerned to local communities.

C.2 Inventory surveys and technical analysis:

Ground water recharge is dynamic in nature and highly dependent upon the spatial and temporal variations of various inputs including rainfall and outputs from the system in terms of withdrawal, exchange with surface water streams and water bodies. The manifestation of these inputs and outputs and their resultant is measured in terms of water level
changes. Inventory surveys and technical analysis of the proposed area will be carried out in consultation with the community. The GWD (Client) at state level and Cluster level would supervise the activities and monitor the progress. Detail surveys would be carried out to collect information on geology, groundwater hydrology, agriculture, irrigation, socio-economic conditions in the cluster area. The survey on geology, hydrology, and hydrogeology would be carried out in the proposed area to define the boundary of the aquifer and groundwater situation.

C.3 Information Education and Communication (IEC) Campaign:

Results of surveys will provide basic and essential inputs for understanding the prevailing situation and designing the IEC strategy suitable to cluster area. It is necessary to develop consensus amongst all stakeholders in the aquifer area for their active participation in every decision making process and to create awareness about the need for groundwater management by the community. This would be achieved through an intensive Information Education and Communication (IEC) campaign to inculcate the sense of belonging among the community for all project activities. Individually addressed communication through participatory work between project and the local communities is important. Prepare IEC material & strategies with the support of project which will be widely circulated in the cluster area. Based on the feedback received from the community/other agencies, NGO will modify the IEC material for achieving the project objectives.

The IEC program will mobilize the community to come forward for managing the groundwater resources themselves and will create conducive environment necessary for the formation of local groundwater management organizations in the aquifer area for implementing the Project.

To facilitate such communication prepare regular pamphlets and other minor publications in an effective manner using local language, Wall Paintings and Display Boards, Focus Group Meetings, regular newsletters / pamphlets, Street Play, Nuked Natak & Puppet Shows, Folk dance, Local artist would be planned. Identify the number & location for Wall Paintings, Slogans and installation of Display Board etc. on watershed management options with the help of community.

The intensive IEC will create the social consensus, necessary to motivate the local water users to join and participate in the local groundwater management committees.

a) Specific IEC campaign would address following aspects:

i. The availability of water is limited and therefore, should be used efficiently.

ii. The limited water resources are still manageable to provide livelihood to the community as a whole if the community adopts various demand and supply side interventions and participatory approach.

iii. It is possible to maintain the present income if the groundwater resources are managed properly by the community who shall allocate the available water resources to different water uses.

iv. Rain Water conservation is essential for sustainable development.
v. Effectively disseminate the technical inputs such as allocation of ground water for different uses, changes in water levels, water quality and management options, crop diversification suitable for local conditions.

vi. Installation of water use measurement devices (water meters) on all ground water withdrawal structures to regulate groundwater extraction and usage and monitoring of withdrawal of ground water for assessment of ground water resources.

vii. Low cost methods for improving on-farm water use efficiency such as alternate furrow irrigation, paired row irrigation, use of crop residues as mulches for reducing evaporation losses.

viii. Adopt possible mitigating measures i.e. switch over to efficient method of irrigation like drip and sprinkler, low water demand crops etc.

ix. Adopt crop diversification plan to shift from high volume low value crops to low volume high value crops, which require less inputs specially water. This would include adoption of horticulture crops and protected cultivation.

C.4 Formation of Community based Organizations (CBOs)

a) Community Participation: NGO will;
   i. work with the villagers to sensitize them with the project objectives, expected output/outcomes, process of planning & implementation and also carry out an assessment of preparedness & willingness of the villagers/community.
   ii. ensure that community's interest/willingness to participate in implementation of CACP is based on the respond to community problems & meeting the objectives of CACP.

b) Mobilization of the Community: NGO will:
   i. mobilize the local community of the cluster area and their capacity also enhanced to take up various activities envisaged for sustainable management of groundwater.
   ii. organize the community into Community Based Organizations (Community). At Village level Multi Task Groups (MTGs), Gram Panchayat level Ground Water Management Committees (GWMC) and aquifer level Ground Water Management Association (GWMA). To facilitate the communities for these activities, a Consultancy Agency & NGO would be contracted.
   iii. enhance overall capacity & communication skills to CBOs & all other local beneficiary on community mobilization.

C.5 Mass awareness Camps:

a) The objective of mass awareness camps is to sensitize the farming community about the project so that farmers could understand about the project, its component, activities, implementation arrangement, benefits of the project, key performance indicators etc.

b) One day mass awareness camps should be organized at village level so that message about the project could reach in every village. IEC material should be prepared for mass awareness camps like charts, pamphlets, posters etc. & distributed amongst villagers. It is
also ensured that the message/material about the project should reach almost more than 50% of farming community. Data base should also be prepared for monitoring of impact of this program.

C.6 Orientation programs:

a) The objective of orientation program is to sensitize the beneficiaries, progressive farmers, members of groups, members of PRIs, members of concerning staff working in the area. One day orientation program should be organized at GP level so that the message about the project could reach in every GP. IEC material should also be prepared for orientation program like Philip charts, pamphlets, posters, video clips of success stories etc. It is also ensured that the message/material about the project should reach almost more than 80% of the community groups and PRIs. The orientation program should be organized in such a way that all progressive farmers, members of groups, PRIs, members of concerning staff should be cover in three phases. A data base should also be prepared for monitoring of impact of this program.

C.7 Exposure visits:

a) The objective of exposure visits is to realize the farming community, PRIs, community groups, project staff etc. about the impact of the activities proposed in the project. The Exposure visits for Village Level Workers, Supervisors, farming community, PRIs, community groups, project staff etc. within the state and outside the state should be organized in the project so that they could explore their knowledge as well as experiences about the technical and social innovations. Exposure visits of successful work/project including Animal Husbandry projects in State as well as National level should be organized in such a way that members of community based groups, PRIs, project staff are covered in three phases. A data base should also be prepared for monitoring of impact of this program. Groups of 20 Goat farmers will travel for 3 or more days to visit goat market & production model in CSWRI (Tonk)/ CIRG, Agra other suitable areas or research/university farms which will be organized with in state and outside the state.

C.8 Training and capacity building of community & Community Based Organization:

- Paradigm shift in considering groundwater as a common property resource that is defined by the aquifer boundaries and is not controlled by individual land holdings or administrative units.
- Work with community/stakeholders on acceptance of registration of all ground water withdrawal units with the Ground Water Management Association (GWMA) & installation of water meters on wells/tube wells for measurement of extraction of GW withdrawal for sustainable use;
- Enhance the capabilities of farmers & Community to accept the installation of water meters on wells/tube wells for measurement of extraction of GW for sustainable use in the cluster area.
- Train the community on measurement of quantity of water withdrawal from ground water withdrawal structure
• motivate and encourage the community to switch over from flow irrigation method to more efficient pressure irrigation methods like sprinkler and drip which saves more than 50% of irrigation water demand;

• educate the community to adopt ridge and furrow method of irrigation instead of basin and flow irrigation system to reduce groundwater use;

• motivate the community to procure Drip Irrigation system through convergence with the other Government scheme.

• discouraged the community to grow high water demand crops and switch over to the other low water demand crops which could give them similar level of income and this would also be a part of the mobilization campaign;

• educate the community to adopt crop diversification from high volume low value crops to low volume high value crops, which require less inputs specially water;

• promote the community in adoption of latest technology such as Green Houses, Poly houses, drip/ sprinkler irrigation system to increase irrigation efficiency and save water;

• Motivate and encouraged the farmers for promoting water efficient irrigation techniques such as sprinklers and drips through community & Community Based Organizations (CBOs).

• Train & mobilize the members of farmers & Community on Excel program prepared for crop water budgeting and preparation of crop plan for the aquifer area based on the available groundwater recharge very year.

• Train & mobilize the members of farmers & Community on Excel program prepared for crop water budgeting and preparation of crop plan for the aquifer area based on the available groundwater recharge very year.

• Enhance the capabilities of farmers & Community to prepare Groundwater Use Plan for allocation of groundwater for different purposes and regulate withdrawal of groundwater in the aquifer.

• Enhance the capabilities of farmers & Community to monitor groundwater conditions by periodical monitoring of the water levels, area under different crops and other water related parameters to estimate ground water resources on an annual basis.

• Trainings of Community in data recording and monitoring of water levels and management of the data

• Enhance the capabilities of farmers & Community to regulate the withdrawal of ground water.

• Enhance the capabilities of farmers & Community to accept GW budgeting based restriction to control irrigated area expansion.

• Training of community & Community on O&M of water meter

• Enhance the capabilities of farmers & Community to become as economically and institutionally sustainable over the project period.
• Train & mobilize the members of Community to take over the asset management and maintenance task and made suitable administrative and financial arrangements for their maintenance and further development.

• Promote and encourage farmers & Community for protection, development, conservation, equitable use of groundwater in the aquifer

• facilitate & build up capabilities of the CRP to collect data/ records from the hydrological monitoring networks & monitor/analyze on regular basis and maintaining proper records.

C.9 Installation of Piezometers/ Observation Wells:

Piezometers/Observation Wells are proposed to be constructed in the cluster area. Piezometers will be installed in the cluster area for monitoring the groundwater levels and chemical quality of groundwater in the aquifer located at different depths. Observation Wells will help in assessing the impacts of groundwater recharge structures. Piezometers/Observation Wells will be installed with Digital Water Level Recorder Telemetric (DWLR Telemetric).

C.10 Installation of Weather and Rain Gauge Station:

Weather and Rain Gauge station to be installed in the aquifer area for monitoring rainfall distribution pattern. Consultancy Agency will help in installation of Weather and Rain Gauge station at the selected location in cluster area for monitoring rainfall distribution pattern. Automatic Weather and Rain Gauge will be provided by the Project.

C.11 Physical Activities (Investments):

Consultancy Agency will enlist all types of physical activities (investments) needed in the cluster in consultation with the community and community based organization i.e. Multi Task Groups (MTGs), Ground Water Management Committees (GWMCs) at Gram Panchayat Level, Ground Water Management Association (GWMA) across the cluster (aquifer). These investments include supply side interventions, Activity Display Board and demand side management for execution of cluster specific strategy. Consultancy Agency will also assess, estimate, analyze and along with technical write-up and detailed cost-tables based on sufficient reasoning and satisfactory ground to justify the estimated amounts for each activity proposed. These estimates shall also indicate the break-up of cost on labor and material. Consultancy Agency will also ensure that all physical activities (Investments) proposed in consultation with community/ CBO’s are well distributed across the cluster area and strictly adhere to the objectives of the project;

C.11.1 Demand control measures:

Consultancy Agency in consultation with community would select specific activities suitable to local conditions and acceptable to the community for initiating groundwater management. Unless water demands are controlled, augmented supplies made available through groundwater recharge structures are likely to be utilized by expansion in agricultural and other uses. Some of the activities which can help to reduce the groundwater demand are:
a) **Crop water budgeting during entire project period:** Consultancy Agency will:-

i. collect and collate yearly information from all running wells pertaining to the depth of wells, yield of wells, area irrigated by the wells, present cropping pattern, crop water requirement, irrigation practices, irrigation scheduling crop area and production during different seasons i.e. Kharif, Rabi and Zaid in consultation with Agriculture department. The Consultancy Agency shall analyse and prepare database on Arc-Info GIS platform for the cluster area;

ii. develop an excel program on crop water budgeting exercise (CWB) and carry out crop water budgeting exercise (CWB) at farmer level on an annual basis so as to match the water resources availability with the Rabi & Zaid season crop plan and requirements for perennial crops based on the sustainable groundwater availability for very year;

iii. prepare farmer level crop water budgeting (CWB) plan with existing cropping pattern as well as the proposed diversified cropping pattern in consultation with the community/ CBO’s considering present sustainable ground water availability for agriculture & present cropping pattern, crop water requirement and irrigation scheduling;

iv. share the results of the crop water budgeting exercise to the community on a regular basis and undertake survey of the cluster to determine the extent of adoption of the decisions taken during the Rabi & Zaid season crop;

v. on yearly basis comparisons of the adoption rates, changes in the irrigation practices (scheduling, irrigation methodology, usages of water saving and conservation practices); calculation of water saved through CWB (both projected and actual).

b) **Installation of water use measurement devices (water meters):**

Consultancy Agency will motivate the Community Organizations and Community for installation of water use measurement devices (water meters) on all ground water withdrawal structures to regulate groundwater extraction and usage and monitoring of withdrawal of ground water for assessment of ground water resources. PIU-GWD / PMU will procure water meters as per World Bank procurement guidelines. Water meters on all the ground water withdrawal structures are to be installed within two months of procurement of Water Meters by PIU-GWD / PMU-RACP. The maintenance would be bear by the project during project period.

c) **Switch over to efficient method of irrigation (drip and sprinkler):**

The Consultancy Agency will motivate and encourage the farmers in the cluster area to switch over from flow irrigation method to more efficient pressure irrigation methods like sprinkler and drip which saves more than 50% of irrigation water demand. Similarly, farmers would be educated to adopt ridge and furrow method of irrigation instead of basin and flow irrigation system to reduce groundwater use. NGO will motivate the
community to procure Drip Irrigation system through convergence with the other Government scheme.

d) Adoption of horticulture crops instead of high water consuming crops:

Studies have indicated that pressure irrigation system like sprinkler and drip, adopted for horticulture and high water demand crops reduces the water requirements up to 50% to 75% compared to flow basin irrigation. Hence there exists good scope for the Consultancy Agency to promote horticultural crops. Promote the community in adoption of latest technology such as green houses, Poly houses, drip/ sprinkler irrigation system to increase irrigation efficiency and save water, low cost methods for improving on-farm water use efficiency such as alternate furrow irrigation, paired row irrigation and crop diversification from high volume low value crops to at low volume high value crops, which require less inputs specially water. Discourage the farmers for flow irrigation practices and adopt Drip irrigation system.

e) Switching over to low water demand crops:

As a part of demand side management strategy, the farmers in the area would be discouraged to grow high water demand crops and switch over to the other low water demand crops which could give them similar level of income. This would also be a part of the mobilization campaign through Consultancy Agency/NGO in the cluster areas. The above examples illustrate a few physical activities which can be taken up in the cluster areas. Since groundwater management needs and options vary greatly at local levels, making standardized approach is difficult at this stage.

f) Community Based Aquifer Level Groundwater Management rights to GWMA:

Enable the community to manage the groundwater on an aquifer level which covers entitlement of equitable groundwater for various users by a multitier participatory framework involving local communities and transforming the groundwater rights to GWMA. Stakeholder participation in ground water management is essential for the following reasons:

- Management decision taken unilaterally, without social involvement it is impossible to implement
- Management activities like monitoring, in selection and fee collection to be carried out more effectively through cooperative efforts
- Ground water management decisions taken with the participation of stakeholders should help to bring:
  (a) social benefits, because they tend to promote equity among users
  (b) economic benefits, because they tend to optimize pumping and reduce energy costs
  (c) technical benefits, because they usually lead to better estimates of water abstraction
f. Suggestive Social Regulations to adopt Community Based Aquifer Level Ground Water Management Model:

a. Ground water is a social, Economic and Environment goods hence declare as common property resource that is defined by the aquifer boundaries and is not controlled by individual land holdings or administrative units.
b. Registration of all ground water withdrawal structures with the Ground Water Management Association (GWMA).
c. No new bore well, Dug well etc. will be constructed without prior permission of the GWMA.
d. Act according to the Central Ground water Authority Rules and Regulation issued from time to time for Notified and Non-notified areas.
e. Capable to prepare Ground Water Use Plan for allocation of groundwater for different purposes and regulates withdrawal of groundwater in the aquifer.
f. Capable to prepare crop water budgeting and plan for the aquifer area based on the available groundwater recharge very year.
g. Equitable assess of Ground water to all community/stack Holders.
h. Increase ground Water by conservation and recharge.
i. One day rest for well/tube well for saving of ground water and electricity both.
j. Create drinking water access to entire community.
k. Assessment of economic value of ground Water for taking appropriate resource allocation and management decision.
l. Water Rights in the form of Well permits and volumetric use rights to all the families in the aquifer area.
m. Water selling possibilities for allocated Ground Water.
n. Agriculture Water management through Technological interventions, Cropping system change, Growing of high productivity crop with per unit water, Application of Micro-irrigation system with less water consumption per unit of land.
o. Community self-imposed GW budgeting based restriction to control irrigated area expansion
p. Ground Water abstraction charges should be fixed much higher than true value.
q. Ground water abstraction through wells in sequences just like Varabandi.
r. Self-sustaining by adopting Social Regulation even after the project period so that community leads in Ground Water Resource Management as well as agriculture production management.

g) Installation of Activity Display Board: Install Activity Display Board at selected location of each village and also in the office of every GWMC and GWMA. Village workers of the respective villages will write information about agriculture crops grown in the area with productivity, water levels monitored from Piezometers/representative wells, availability of utilizable annual ground water etc. on the display Board.
C.11.2 **Supply side Interventions:** Consultancy Agency will:-

i. carry out the estimation of Rain water resources as available within the cluster based on the analysis of the long term hydro metrological data;

ii. Supply side intervention activities are intended to augment run-off surplus into the aquifer and thereby increase its availability naturally and artificially. Rainfall is the main source of recharge into Aquifer. Artificial recharge efforts are basically aimed at augmentation of the natural movement of surface water into ground water reservoir through suitable civil construction techniques.

iii. conduct detailed analysis with the data & information generated by the detailed survey and assess the number and types of Artificial Recharge Structures proposed to be constructed necessary to augment the available surplus rain/surface water into the Aquifer using surface and sub-surface recharge methods best suited after participatory appraisal with the community/CBO’s to identifying groundwater problems and specific physical activity for a particular area in the cluster as define in OG & prepare ground water recharge plan for the cluster area and submit to the client for approval;

iv. assess the number and types of Artificial Recharge Structures/Rain Water Harvesting structures proposed to be constructed necessary to augment the available surplus rain/surface water into the Aquifer after participatory appraisal with the community/CBO’s;

v. prepare site specific plans for the community recharge structures/water harvesting structure containing detailed design, drawings and cost estimates and other related documents based on the technical criteria & design specifications. The cost-tables based on sufficient reasoning and satisfactory ground to justify the estimated amounts for each activity proposed. The estimates shall also indicate the break-up of cost on labor and material;

vi. prepare the process, manuals for quality verification of the work implemented by the communities/individual beneficiaries;

vii. also ensure that all physical activities (Investments) proposed in consultation with community/CBO’s are well distributed across the cluster area and strictly adhere to the objectives of the project. Specification and Bid document will be prepared by the NGO and procurement will be done by the Community Based Organizations (GWMCs)/Individual Beneficiaries as the case may be;

viii. develop at least three scenarios to add Farm ponds in the individual farm to augment the available surplus Rain water with or without lining in order to strike the optimum water availability in Rabi season for the respective scenarios with regard to the existing water resources commitment of the downstream;

ix. proposed any new structures to individual beneficiaries which includes costs, locations, time period, and other implementation arrangements;
x. help the concerned member(s) of MTGs (individual lands Owner) in preparation of technical specifications for the material procurement for Works to be carried out by him. Task assignment for the activities as per pre-defined output based results would be given to the members of MTGs by the concerning PIAs.

xi. resubmit the technical drawing, design and the estimates for community / individual structure / area for Pasture development to the respective DPM, PIA for clearance and submit to the Client for sanction and approval. These technical drawings, designs and the estimates would be approved/sanctioned by the Client / PMU with the indication of time period of activity to be carried out.

xii. inform the Community that Initial sanctioned issued by the Client for individually structure will be updated by the Client keeping it relevant to the BSR rate as applicable on the date of execution. Payment will be made within the revised sanctioned issued by Client avoiding any post-facto sanction.

xiii. help the GWMC / Individual Beneficiary in preparation of technical specifications for the material, obtaining quotations, and its analysis for procurement of material. All materials would be procured as per prevailing World Bank Procurement Guidelines.

xiv. The RACP would bear the capital cost of the community structure. The maintenance cost of Ground water Recharge structures would be managed by the GWMA through community participation.

xv. 20% beneficiary contribution from general farmers and 10% beneficiary contribution from Small & marginal farmers would be charged against the construction of individual Farm pond to harvest the Rain Water.

xvi. support in maintaining record of works executed by the Community (GWMCs)/individual beneficiaries in standard form of measurement book (MB) & counter-signed by the chairman & secretary of concerned GWMCs jointly with civil engineer & Team Leader of Consultancy Agency. The MB shall be made available for inspection and verification to the Client & Project;

xvii. finalize Work Completion Certificate for each structure / individual beneficiary Farm Pond with details with joint signature of chairperson of GWMCs / Individual beneficiaries, civil experts & team leader of Consultancy Agency;

xviii. design observation well network and select location of Artificial Recharge Structures within 30 days of completion of site specific plan for recharge structure in consultation with the client to study the impact of artificial recharge structures on recharge. Use Geophysical technique for the selection of appropriate site for artificial recharge structures which mostly to help and assess the unknown sub-surface Hydrogeological conditions:

xix. support in drilling of Piezometers / observation wells and collection of drill cutting samples during drilling process and analyzes the data with respect to sub-surface geology and recommends their design in consultation with the client;
ensure that the Piezometers / observation wells be installed with telemetric Digital water level recorders (DWLR) within 30 days of procurement by the client / PMU for continuous monitoring of water level and impact assessment of effective ground water management.

conduct aquifer performance test for safe yield /slug test / recharge test to understand the capacity of artificial recharge of aquifer on each observation well, constructed for impact assessment.

C.11.3 Scope for artificial recharge:

i. **Artificial Recharge** techniques interrelate and integrate the source water to ground water reservoir and are dependent on the Hydrogeological situation of the area concerned. The hydraulic effects generated by artificial recharge are basically of two types, viz. Piezometric effect and volumetric effect.

**Piezometric effect:**

The Piezometric effect results in a rise of the Piezometric surface, the magnitude of which depends on the geologic and hydraulic boundaries of the aquifer being recharged and the type, location, yield and duration of the recharge mechanism. It is also related to the ratio of transmissivity (T) of the aquifer and the replenishment coefficient (C), which is equal to the storage coefficient.

**Volumetric effect:**

The volumetric effect is related to the specific yield, replenishment coefficient, transmissivity and the geologic and hydraulic boundaries of the aquifer.

ii. The scope for artificial recharge in an area is basically governed by the thickness of unsaturated material *available above the water table* in the unconfined aquifer. Contour maps prepared from the average post-monsoon water level data with suitable contour intervals can be used for assessment of available storage space. Aquifers best suited for artificial recharge are those, which absorb large quantities of water and release them whenever required.

C.11.4 Planning of Artificial Recharge:

The first step in planning the project is to demarcate the area of recharge. The Project can be implemented systematically in case a hydrologic unit like watershed is taken for implementation. However, localised schemes are also taken to augment ground water reservoir. Artificial recharge techniques aim at extending the recharge period in the post-monsoon season for about three or more months, resulting in enhanced sustainability of ground water sources during the lean season.

The *artificial recharge* to ground water is normally taken in following areas:

1. Areas where ground water levels are declining on regular basis.
2. Areas where substantial amount of aquifer has already been desaturated.
3. Areas where availability of ground water is inadequate in lean months.
4. Areas where salinity ingress is taking place.

C.11.5 Finalisation of Physical Plan for artificial recharge:

The finalization of physical plan for artificial recharge involves the following steps:

- Preparation of lay-out plan of the project area on an appropriate scale showing the locations of proposed structures and source of water conveyance systems.
- Determination of the number of structures required for recharge.
- Identification of tentative locations of proposed structures
- Community’s acceptance of the type and number of structures
- Preparations of design specifications and drawings
- Working out the time-schedules for completion of various stages of the scheme.
- Planning of financial aspects such as source of funds, allocations required at various stages, schedules of repayment etc.

C.11.6 Advantages of Artificial Recharge:

Artificial recharge is becoming increasingly necessary to ensure sustainable groundwater supplies to satisfy the needs of a growing population. The benefits of artificial recharge can be both tangible and intangible. The important advantages of artificial recharge are:-

- Subsurface storage space is available free of cost and inundation is avoided
- Evaporation losses are negligible
- Quality improvement by infiltration through the permeable media
- Biological purity is very high
- It has no adverse social impacts such as displacement of population, loss of scarce agricultural land etc
- Temperature variations are minimum
- It is environment friendly, controls soil erosion and flood and provides sufficient soil moisture even during summer months
- Water stored underground is relatively immune to natural and man-made catastrophes
- It provides a natural distribution system between recharge and discharge points
- Results in energy saving due to reduction in suction and delivery head as a result of rise in water levels.

C.11.7 Implementation of Artificial Recharge Schemes:

Successful implementation of artificial recharge schemes will essentially involve the following major components
Assessment of source water
Planning of recharge structures
Finalisation of specific techniques and designs
Monitoring and impact assessment
Financial and economic evaluation

C.11.8 Techniques of harvesting of Rain Water and Artificial Recharge:

Once the areas requiring artificial recharge are identified, the next step is to decide on the appropriate techniques for recharging the aquifer. The synthesis of all available data relevant to ground water is the first step in this exercise. These data include:

- all sources of recharge like rivers, tanks, canals etc.
- rainfall distribution pattern,
- Hydrogeological parameters with emphasis on Lithological characteristics,
- nature of the terrain,
- intensity of ground water development and irrigation practices and
- chemical quality of surface and ground water etc.

The various data is generally available in reports/records of Central and State Government agencies. However, the data available often have considerable gaps. It is therefore necessary to have detailed studies to supplement the available data and for preparation of a scientific data base for proper implementation of suitable artificial recharge schemes. Once the need for and suitability of the area for artificial recharge to ground water are identified on the basis of data collected from the general studies, areas identified as suitable for recharge augmentation are studied in detail using Remote Sensing techniques and through hydro meteorological, hydrological, geophysical, Hydrogeological and hydrochemical investigations to ascertain the scope and feasibility of artificial recharge.

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<th>Type of Study</th>
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<td>Characteristics of various litho-units.</td>
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<th>3</th>
<th>Hydrological Studies</th>
<th>Source water availability, infiltration characteristics of major soil types and various land use categories</th>
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<td>5</td>
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<td>Quality aspects of source water for Artificial recharge. Consultancy spatial and temporal variations in ground Water quality.</td>
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</table>

Wide spectrums of techniques are in vogue to recharge ground water reservoir. The artificial recharge techniques too vary widely similar to the variations in Hydrogeological framework. A few possible groundwater recharge techniques that could be selected by Community for implementation of Artificial Recharge Schemes depending upon their need and technical feasibility are as below:

**C.11.8.a Ditch and Furrow Method:**

In areas with irregular topography, shallow, flat bottomed and closely spaced ditches or furrows provide maximum water contact area for recharge water from source. This technique requires less soil preparation than the recharge basins and is less sensitive to silting.
**C.11.8.b Percolation Tanks (PT)**

These are the most prevalent structures as a measure to recharge the ground water reservoir both in alluvial as well as hard rock formations. The efficacy and feasibility of these structures is more in hard rock formation where the rocks are highly fractured and weathered.

**Important Aspects of Percolation Tanks:**

a. A detailed analysis of rainfall pattern, number of rainy days, dry wells, and evaporation rate and detailed hydrogeological studies to demarcate suitable percolation tank sites.

b. In semi arid climate, the storage capacity of percolation tank is designed such that the water percolates to ground water reservoir by January since the evaporation losses would be high subsequently.

c. Percolation tanks are normally constructed on second to third order stream since the catchment so also the submergence area would be smaller.

d. The submergence area should be in uncultivable land as far as possible.

e. Percolation tank be located on highly fractured and weathered rock for speedy recharge. In case of alluvium, the boundary formations are ideal for locating Percolation Tanks.

f. The aquifer to be recharge should have sufficient thickness of permeable vadose zone to accommodate recharge.

g. The benefitted area should have sufficient number of wells and cultivable land to develop the recharge water.

h. Detailed hydrological studies for run off assessment be done and design capacity should not normally be more than 50% of total quantum of rainfall in catchment.

i. Waste weir or spillway is suitably designed to allow flow of surplus water based on single day maximum rainfall after the tank is filled to its maximum capacity.

j. Cut off trench is provided to minimise seepage losses both below and above nalla bed.

k. To avoid erosion of embankment due to ripple action stone pitching be provided upstream up to HFL.

l. Monitoring mechanism in benefitted as well as catchment area using observation well and staff gauges are provided to assess the impact and benefits of percolation tank.

**C.11.8.c Check Dams Cement Plug nalla bunds:**

Check dams are constructed across small streams having gentle slope and are feasible both in hard rock as well as alluvial formation. The site selected for check dam should have sufficient thickness of permeable bed or weathered formation to facilitate recharge of stored water within short span of time. The water stored in these structures is mostly confined to stream course and the height is normally less than 2 m. These are designed based on stream width and excess water is allowed to flow over the wall. In order to avoid scouring from excess run off, water cushions are provided at down streamside. To
harness the maximum run off in the stream, series of such check dams can be constructed to have recharge on regional scale.

A series of small bunds or weirs are made across selected nalla sections such that the flow of surface water in the stream channel is impeded and water is retained on pervious soil/stock surface for longer body. Nalla bunds are constructed across bigger nalla of second order streams in areas having gentler slopes. A nalla bund acts like a mini percolation tank.

**Site Characteristic and Design Guidelines:** For selecting a site for Check Dams/Nalla bunds the following conditions may be observed.

a. The total catchment of the nalla should normally be between 40 to 100 Hectares. Though the local situations can be guiding factor in this.

b. The rainfall in the catchment should be less than 1000 mm/annum.

c. The width of nalla bed should be at least 5 metres and not exceed 15 metres and the depth of bed should not be less than 1 metre.

d. The soil downstream of the bund should not be prone to water logging and should have pH in between 6.5 to 8.

e. The lands downstream of Check Dam/bund should have irrigable land under well irrigation.

f. The Nalla bunds should be preferable located in area where contour or graded bunding or lands have been carried out.

g. The rock strata exposed in the ponded area should be adequately permeable to cause ground water recharge through ponded water.

h. Nalla bund is generally a small earthen dam, with a cut off core wall of brick work, though cement bunds/plugs are now prevalent.

i. For the foundation for core wall a trench is dug 0.6 m wide in hard rock or 1.2 metres in soft rock of impervious nature. A core brick cement wall is erected 0.6 m wide to stand at least 2.5 metres above nalla bed and the remaining portion of trench is back filled on upstream side by impervious clay. The core wall is buttressed on both sides by a bund made up of local clays and on the upstream face, stone pitching is done.
j. Normally the final dimensions of the Nalla bund are; length 10 to 15 metres, height 2 to 3 metres and width 1 to 3 metres, generally constructed in a trapezoidal form. If the bedrock is highly fractured, cement grouting is done to make the foundation leakage free.

11.8.d Gabion Structure:

This is a kind of check dam being commonly constructed across small stream to conserve stream flows with practically no submergence beyond stream course. The boulders locally available are stored in a steel wire. This is put up across the stream’s mesh to make it as a small dam by anchoring it to the streamsid. The height of such structures is around 0.5 m and is normally used in the streams with width of about 10 to 15 m. The excess water overflows this structure storing some water to serve as source of recharge.

C.11.8.e Modification of Village tanks as recharge structure:

Most villages have village ponds/ tanks to store rainwater for uses other than human consumption like livestock consumption and at the same time help in recharging groundwater in the aquifers in their vicinity. With passage of time these village ponds have been silted or damaged. If such structures are suitably renovated they would store more rainwater and increase recharge to the groundwater. In general no “Cut off Trench” (CoT) and Waste Weir is provided for village tanks. Desilting, coupled with providing proper waste weir and CoT on the upstream side, the village tanks can be converted into recharge structure.

C.11.8.f Inter Watershed Transfer:

The percolation tanks in a watershed may not have enough catchment discharge though a high capacity tank is possible as per site conditions. In such situations stream from nearby watershed can be diverted with some additional cost and the tank can be made more efficient.

C.11.8.g Scattered pits:

Staggered trenches are excavated trenches of shorter lengths in a row along the contour with inter spaced between them. In the alternate row, the trenches will be located directly below one another. The length of staggered trenches is 3-3.65 m with inter spaces between them in same row of about 2.4 to 3 m.
C.11.8.h Anicuts/Tanks:
Where ever feasible small water harvesting structures called Anicuts, ponds/Talia’s are constructed. Suitable site selection is important.

C.11.8.i Farm Ponds:
The substantial runoff will be lost from the cluster during the rainy season. This runoff not only lost but it will promote soil erosion in the cluster. So this runoff should be harvested in the cluster itself whether it is private land or community land. The farm ponds will be constructed in private land to harvest the excess runoff after in-situ moisture conservation. The farm ponds will be identified/proposed at a lower elevation in the individual farm area as per suitable technical design. These structures not only will be beneficial to recharge the ground water but pressure on ground water can be reduced, because this harvested water farm ponds will be used to fulfil crop water requirement of the Rabi crops in the cluster. So, the harvested water of farm ponds will be beneficial to manage Ground Water extraction during Rabi season because harvested water in farm ponds will be used to fulfil crop water requirement of the crops in the cluster.

C.11.8.j Dug Well Recharge:
In alluvial as well as hard rock areas, there are thousands of dug wells which have either gone dry or the water levels have declined considerably. These dug wells can be used as structures to recharge. During rainy seasons, a substantial quantity of rainwater is lost as runoff. If this runoff is diverted into a pit constructed at a lower elevation in the area and from there, after filtration, induced into an existing well, it would then enhance the recharge to the aquifers. The ground water reservoir, storm water, tank water, canal water etc. can also be diverted into these structures to directly recharge the dried aquifer. By doing so the soil moisture losses during the normal process of artificial recharge, are reduced. The recharge water is guided through a pipe to the bottom of well, below the water level to avoid scoring of bottom and entrapment of air bubbles in the aquifer. The quality of source water including the silt content should be such that the quality of ground water reservoir is not deteriorated.

C.11.8.k Recharge Shaft:
These are the most efficient and cost effective structures to recharge the aquifer directly. In the areas where source of water is available either for some time or perennially e.g. base flow, springs etc. the recharge shaft can be constructed.

**Site characteristics and design guidelines: -**

- To be dug manually of the strata is non-caving nature.
- If the strata is caving, proper permeable lining in the form of open work, boulder lining are should be provided. The diameter of shaft should normally be more than 2 m to accommodate more water and to avoid eddies in the well.
- In the areas where source water is having silt, the shaft should be filled with boulder, good and sand from bottom to have inverted filler. The upper sandiest layer has to be removed and cleaned periodically. A filter is provided before the source water enters the shaft.
- When water is put into the recharge shaft directly through pipes, air bubbles are also sucked into the shaft through the pipe which can choke the aquifer. The injection pipe should therefore be lowered below the water level, to avoid this.

The main advantages of this technique are as follows: -

- It does not require acquisition of large piece of land like percolation tanks.
- There are practically no losses of water in the form of soil moisture and evaporation, which normally occur when the source water has to traverse the vadose zone.
- Disused or even operational dug wells can be converted into recharge shafts, which do not involve additional investment for recharge structure.
- Technology and design of the recharge shaft is simple and can be applied even where base flow is available for a limited period.
- The recharge is fast and immediately delivers the benefit. In highly permeable formation, the recharge shaft are comparable to percolation tanks with no submergence and hence no land compensation to local farmers.

The recharge shafts can be constructed in two different ways viz. Vertical and lateral.

**Vertical Recharge Shaft: –**

The vertical recharge shaft can be further improvised with injection well at the bottom of the shaft.

**(a)Without Injection well**

- Ideally suited for deep water levels (up to 15 metres b.g.l.)
- Presence of clay is encountered within 15 m.
- Effective in the areas of less vertical natural recharge.
- Copious water available can be effectively recharged.
• Effective with silt water also (using inverted filter consisting of layers of sand, gravel and boulder)

• Depth and diameter depends upon the depth of aquifer and volume of water to be recharged.

• The rate of recharge depends on the aquifer material and silt content in the water.

• The rate of recharge with inverted filter ranges from 7 - 14 LPs for 2 - 3 meter diameter.

(b) With Injection Well

In this technique at the bottom of recharge shaft a injection well of 100 - 150 mm diameter is constructed piercing through the layers of impermeable horizon to the potential aquifers to be reached about 3 to 5 meter below the water level.

• Ideally suitable for very deep water levels (more than 15 meters)

• Aquifer is overlain by impervious thick clay beds

• Injection well can be with or without assembly

• The injection well with assembly should have screen in the potential aquifer at least 3 – 5 meter below the water level.

• The injection well without assembly is filled with gravel to provide hydraulic continuity so that water is directly recharged into the aquifer

• The injection well without assembly is very cost effective.

• Depending upon volume of water to be injected, number of injection wells, can be increased to enhance the recharge rate.

• The efficiency is very high and rate of recharge goes even up to 15 lps at certain places.

Lateral Recharge Shaft:-

• Ideally suited for areas where permeable sandy horizon is within 3 meter below ground level and continues up to the water level - under unconfined conditions

• Copious water available can be easily recharged due to large storage and recharge potential.

• Silt water can be easily recharged

• 2 to 3 meter wide and 2 to 3 meter deep trench is excavated, length of which depends on the volume of water to be handled.

• With and without injection well

C.11.8.1 Induced Recharge:

It is an indirect method of artificial recharge involving pumping from aquifer hydraulically connected with surface water, to induce recharge to the ground water reservoir. When the cone of depression intercepts river recharge boundary a hydraulic
connection gets established with surface source which starts providing part of the pumpage yield. In such methods there is actually no artificial build-up of ground water storage but only passage of surface water to the pump through an aquifer. In this sense, it is more a pumpage augmentation rather than artificial recharge measure.

In hard rock areas the abandoned channels often provide good sites for induced recharge. Check weir in stream channel, at location up stream of the channel bifurcation, can help in high infiltration from surface reservoir to the abandoned channel when heavy pumping is carried out in wells located in the buried channel.

The greatest advantage of this method is that under favourable Hydrogeological situations the quality of surface water generally improves due to its path through the aquifer material before it is discharged from the pumping well.

**C.11.8.m Ground Water Dams or Sub-Surface Dykes or Underground Bandharas (UGB):**

These are basically ground water conservation structures and are effective to provide sustainability to ground water structures by arresting sub surface flow. A ground water dam is a sub-surface barrier across stream which retards the natural ground water flow of the system and stores water below ground surface to meet the demands during the period of need. The main purpose of ground water dam is to arrest the flow of ground water out of the sub-basin and increase the storage within the aquifer.

The underground dam has following advantages: -

- Since the water is stored within the aquifer, submergence of land can be avoided and land above reservoir can be utilised even after the construction of the dam.
- No evaporation loss from the reservoir takes place.
- No siltation in the reservoir takes place.
- The potential disaster like collapse of dams can be avoided.
- The aquifer to be replenished is generally one which is already over exploited by tube well pumpage and the declining trend of water levels in the aquifer has set in. Because of the confining layers of low permeability the aquifer cannot get natural replenishment from the surface and needs direct injection through recharge wells.
- In alluvial areas injection well recharging a single aquifer or multiple aquifers can be constructed in a fashion similar to normal gravel packed pumping well. The only difference is that cement sealing of the upper section of the well is done in order to prevent the injection pressures from forcing leakage of water through the annular space of borehole and well assembly.
- In hard rock areas casing and well screens may not be required. An injection pipe with opening against the aquifer to be recharged may be sufficient. However, in case of number of permeable horizons separated by impervious rocks like vesicular basalts or cavernous limestone, a properly designed injection well may be constructed with slotted pipe against the aquifer to be recharged.
C.12 Monitoring Mechanism for Artificial Recharge:

The monitoring of water levels and water quality is of prime importance in any scheme of artificial recharge of Ground Water.

C.12.1 Water Level Monitoring:

Network of observation wells is used to study the ground water flow pattern and temporal changes in potentiometric head in the aquifer.

The objective of monitoring system is to study the effect of artificial recharge on the natural ground water system. Depending on the method of artificial recharge and the hydrogeology of the area, the observation well network has to be designed. The monitoring system of observation well network should be designed specially to monitor impact of individual structures which can further be extended to monitor the impact of group of such structures in the artificial recharge scheme area. The network should contain observation wells (1) near the centre of the recharge facility (2) a sufficient distance from the recharge facility to observe composite effects and (3) near the limit of hydrological boundaries. If the recharged aquifer is overlain by confining/semi-confining layer, Piezometers should be installed to monitor the water levels of overlying and underlying aquifers which helps in the study of leakages etc.

Where the surface water bodies are hydraulically connected with the ground water aquifer which is being recharged, it is advisable to monitor the water level profiles of both Surface water and Ground water.

The periodic monitoring of Water Levels can demarcate the zone of benefit. In this method a network of observation wells is established in the area likely to be benefitted and following observations are made: -

1. In the zone benefitted, the water levels be observed to the whether the well hydrographs have a flat apex during the time when there is water in the recharge structure (tank, pit etc.).

2. Wells situated outside the zone of influence normally show an angular apex for the period when the recharge is taking place, while these situated within the zone of influence have a flatter area.

3. The recession limbs of wells close to a recharge structure normally have a gentle gradient as compared to those located far off.

4. Crops in the zone of influence will be healthy compared to those outside such an area. Furthermore, in the zone of influence there is a tendency to grow crops with high water requirements.

5. Well yields in the zone of influence should be greater than those outside it. The wells in benefitted zones may have more sustainability in lean period than those outside.

C.13 Impact Assessment:
The impact assessment of Artificial Recharge schemes can generally be enumerated as follows:

a) Conservation and harvesting of surplus monsoon runoff in groundwater reservoir which otherwise was going un-utilised outside the watershed/basin and to sea.

b) Rise in ground water levels due to additional recharge to ground water. In case where continuous decline of ground water level was taking place, a check to this and/or the intensity of decline subsequently reduces. The energy consumption for lifting the water also reduces.

c) The ground water structures in the benefitted zone of artificial structures gains sustainability and the wells provide water in lean month when these were going dry. The domestic wells will become sustainable and many of the areas become tanker free.

d) The cropping pattern in the benefitted zone will undergo marked change due to additional availability of ground water and cash crops will start growing. Orchards which went dry earlier due to ground water scarcity may rehabilitate and new plantation is grown.

e) Green vegetation cover may increase in the zone of benefit and also along the structures due to additional availability of soil moisture.

f) The quality of ground water may improve due to dilution.

g) Besides the direct measurable impacts, the artificial recharge schemes will generate indirect benefit in terms of decease in soil erosion, improvement in fauna and flora, influx of migratory birds, etc. Besides, the social and economic status of farmers of benefitted zone will also substantially improve due to increase in crop production.

C.14 Data and thematic layer Management:

i. Consultancy Agency will manage all data on GIS platform using ARC-Info software and production of different thematic maps/layers as part of requirement of preparation and Implementation of CACP for the cluster area. Suggestive some layers are as below:

ii. Base Map with Aquifer boundary, village boundary, Gram Panchayat boundary, transport network, canals, settlements, Key Landmarks & Point of Interest) with all the labels like village names etc..

iii. Land Use & Land Cover (LU/LC) map showing single as well as double cropped area

iv. Contour map at 1 m vertical interval

v. Slope map

vi. Drainage Network Map

vii. Flow Accumulation Map

viii. L-section & Cross section of all Drainage lines greater than 25m length at every 40 meter interval.

ix. Water Table Contour map of 2 m vertical interval

x. Depth to water map of 2 m vertical interval

xi. Aquifer Distribution
xii. Bed Rock configuration map

xiii. Land Resources as well as Ground Water Resources Management Plan Map showing proposed interventions under CACP using different colour/sketches/labels with all the items in legend etc.

C.16 Ground Water Management Sub Plan and Annual Action Plan: Consultancy Agency will:

i. detail out all the stakeholders of the cluster – listing of all stakeholders, including but not limited to, farmers and organizations representing farmers, suppliers of various inputs (both from private and public sectors), processors, agribusiness enterprises.

ii. detail of all ground water extraction structures and all the data collected during detailed Hydrogeological survey and other surveys and enlist all investments needed in the cluster for water investments needed along with technical write-up of these investments. The Ground Water Management Sub Plan will include detailed cost-tables (along with year-wise phasing) for each and every element reflecting any investment of the project funds in GIS format.

iii. assess, estimate and analyse all types of investments which include demand-side management & supply-side interventions required for implementation of cluster specific strategy.

iv. The village wise resources so obtained would form the basis for developing village wise ground water management plans taking in to account the total demand / utilization and availability of ground water and future scope for augmentation.

v. discuss the Ground Water Management Sub Plan in the meeting of respective Gram Panchayat, general body of GWMCs & GWMA, Gram Panchayat and Panchayat Semite covered in the cluster area & properly documented through photography and Video Recording within the 300 days of signing of contract;

vi. Submit detailed plan of action attempting sustainability of ground water sources to the respective Gram Panchayat Semite and discuss about technical and financial merits of approved mitigating measures in the general body of GWMCs & GWMA covered in the cluster area. The activity properly documented through photography and Video Recording and will be provided to RACP.

vii. submit the Ground Water Management Sub Plan along with different thematic layers in GIS environment to the PIA in Ten soft as well as in hard copies including color maps within the 315 days after sign of Memorandum of understanding with the PMU for approval.

viii. prepare Annual Action Plan on the basis of approved GWMSP with the help from Community and submit to the respective PIA for its approval latest by 31st December of the preceding year.

ix. ascertain appropriateness of the proposed groundwater recharge structures as well as other physical interventions in relation to availability of water resources in the cluster area and the self-regulations required for controlling groundwater demand and forward to the same to the PMU with his observations for administrative approval.
within 30 days of receipt of AAP before implementation.

C.17 Implementation of Annual action Plan through Community / CBOs:

a. Consultancy Agency/ NGO will be responsible for implementation of GWMSP/ CACP as per AAP with the support of Community. These works will be monitored by the GWMA, PIA, DPMU, PIU and PMU. At least 25% test check of all the activities under a cluster is mandatory for In-Charge PIA/ DPM-DPMU of respective cluster.

b. Consultancy Agency will ensure that GWMCs/ GWMA will sign a Grant agreement agreements on the type of activities proposed, supply side management, ownership and O&M of the assets/structures created and financial management with PMU on the implementation of the approved AAP. This will include procurement responsibilities. PIU-GWD / PMU will provide a standard format for the agreement to GWMCs.

c. Every individual beneficiary has to sign a grant agreement with the concerned PIA. The format of grant agreement will be provided by PMU-RACP.

d. Consultancy Agency will monitor Monthly water levels for the representative wells and Piezometers. Consultancy Agency will prepare monthly hydrographs and analyses during the project period & prepare database on GIS platform for the cluster area.

e. Consultancy Agency will collect and collate yearly information pertaining to the depth of wells, yield of wells, area irrigated by the wells, cropping pattern, irrigation practices, crop area and production during different seasons i.e. Kharif, Rabi and Zaid during the project period,

C. 18 Procurement Plan:

GWD will prepare a detailed procurement plan comprise computers and accessories, office and communication equipment, furniture and fixtures and other miscellaneous items office and communication equipment, furniture and fixtures scientific equipment’s, and other miscellaneous items for GWMCs, GWMA and GWD, are Measuring taps, Automatic Water Level recorders, Water samples collection bottles, Water meters, DWLR, Micro Irrigation system (Drip & sprinkler System), Wall Paintings, Slogans and installation of Display Board. These items will be procured by the respective PIA/PIU/PMU, RACP as per the World Bank Procurement Guidelines and as per financial manual of RACP. Technical specification will be provided by the respective Line Departments.

C.19 Monitoring and Progress review:

• The progress of physical activities shall be monitored by the client/ DPMU/ PMU-RACP:
• Recording Measurement Books by Consultancy Agency for each groundwater recharge structure and monitoring of quality of works by respective DPM-PIA/ PIU/ PMU-RACP.
Consultancy Agency will coordinate, supervise, and monitor the implementation of the CACP and liaison with the CBOs, DPMUs, PAs, PIUs, and PMU.

Regular monitoring and review of the cluster level implementation process by the PIU-GWD. At least 10% test check of all the activity under a cluster is mandatory for PIU.

PMU will monitor the progress & quality of works from time to time. At least 10% test check of all the activity under the cluster will be mandatory for PMU.

PIU-RACP, GWD & PMU, RACP will conduct regular meetings to review the progress of the project.

C.20 Reporting Requirements:

a. Consultancy Agency will Submit detailed progress reports in the prescribed formats on monthly, quarterly, biannually and annual basis (three copies each, both in hard and soft copy) to DPMU and PMU. The reports shall include photographs, videos, success stories, issues hindering progress, etc.

b. Consultancy Agency will be responsible to keep and maintain records of the each and every sub component of project like groundwater, agriculture, horticulture, livestock and market & value chains etc. and its availability for audits & verifications.

c. Consultancy Agency will execute and implement all the required tasks under the project ensuring and adhering to the social and environmental framework applicable for RACP.

d. Consultancy Agency will ensure that the expenditures incurred by the CBOs are eligible and as per the approved annual action plan (AAP). The service provider shall also ensure that the CBOs are maintaining all prescribed records as well as the books of accounts, vouchers etc. for ready verification by DPMU and PMU.

e. Consultancy Agency will properly document all the activities through photography and Video Recording and provided to PIA with monthly progress reports.

f. Consultancy Agency will develop Alternative Institutional Model and Legal Framework as an exit strategy at the end of the assignment.

C.21 Consolidation and Withdrawal activities: Consultancy Agency will:

a) support GWMA to become economically and institutionally sustainable over the project period.

b) build up capacity of GWMCs & GWMA to take over the task of operation & maintenance of the assets created and make suitable administrative and financial arrangements for their maintenance and further development after the project period as per guidelines.

c) help GWMCs & GWMA in formal allocation of user’s right over common property resources (CPRs) for sustainable utilization of developed natural resources.

d) support GWMA to become capable for the successful discharge of their responsibilities on sustainable and efficient use of water resources, including improved on-farm water use efficiency, reduced water-intensive cropping patterns, increase in agricultural productivity reflecting in overall increase in agriculture.
production to increase in income of farmers and creation of community owned enterprises in the form of Producer Companies in the project area.

e) prepare consolidation and exit strategy & management plan for repair, maintenance and protection of developed common structures/properties.

f) prepare up-scaling and documentation of successful experiences and lessons learnt for future use.

g) prepare & submit withdrawal/exit strategy latest by first month of last year of assignment.

h) prepare Project Completion Report (PCR) with details of each intervention undertaken in the cluster with all the maps, data, photographs and videos along with details of funds available, bank account etc. and submit to client in ten soft as well as in hard copies.

C.22 Technical Support:

The activities envisaged under the cluster area will be implemented by the Consultancy Agency / NGO. Implementation of physical activities will be planned by the GWMC with technical support from PIA / PIU. The subject specialists in PIA/DPMU will help GWMC, GWMA and Consultancy Agency in identification of feasible sites for various groundwater recharge structures proposed by the community. The Annual Action Plan prepared by Consultancy Agency with help from GWMA will be appraised by PIA for technical, economic social and environmental feasibility of each of the activities included in the action plan.

C.23 Technical Review Committee (TRC)

All the interventions proposed by Community and included in the Ground Water Management Action Plan are required to be approved by Technical Review Committee (TRC) prior to their implementation. Technical Review Committee (TRC) will be constituted by the Project Director, RACP-MIS.

C.24 Role of Gram Panchayat (GP):

The Gram Panchayat would carry out following important functions:

a) Consultancy Agency will place the GP level annual plan of activities of CACP, in the meeting of Gram Shaba with the representative of DPMU for perusal. In case Gram Shaba meeting is not scheduled to be held soon, then, copy of GP level plan will be sent to the Gram Panchayat for perusal.

b) GP will support and advise GWMA/GWMs/MTGs from time to time.

c) GP will facilitate the convergence of various other projects/ schemes.

d) GP will make available common lands/structures/ property to GWMA/GWMs / project for development.

e) GP will facilitate in providing office accommodation & providing other facilities as per need/ local requirements to GWMA/GWMs.
C.25 Role of Ground Water Department:
Out of six line departments, Ground Water Department is one of the participation and nodal department of this project. A Project Implementation Unit (PIU) headed by one Nodal Officer in the rank of Superintending Hydrogeologist from the department is established to facilitate the activities associated within the Ground Water Department and to coordinate between department and the PMU-RACP. The PIU will be supported with the expert and provided with other facilities.

Nodal Officers of RACP working in the line departments shall be responsible for:

a) All the technical analysis would be undertaken by the department. Data will be provided by the NGO/Consultancy Agency.

b) Facilitating & extending technical support/input, apart from providing requisite information for identification of clusters time to time as desired by PMU-RACP.

c) To provide technical knowhow to the MTG, GWMCs, GWMA, Consultancy Agency, DPMU and PMU.

d) Suggestions and feedback of the project activities to the PMU- RACP.

e) Help the project in enhancing capacity building on technical aspects to MTG, GWMCs, GWMA, Consultancy Agency, DPMU and PMU.

f) Participate in the quarterly review meetings organized at the level of PMU-RACP.

g) Participate in the meetings / workshops / exposure visits organized under RACP.

h) Find out training & capacity building needs of the departmental Officers and Consultancy Agency&NGO.

C.26 Key Performance Indicator:

Key indicators have been identified to monitor performance of the project. The monitoring will be done based on the impact assessment set up for project interventions. The performance indicators include process, progress, output, and impact. The key indicators are given in Table below:

Table: Key Performance Indicators

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Issue</th>
<th>Project Intervention</th>
<th>Performance Indicator</th>
<th>Impact</th>
<th>Monitoring Period</th>
<th>Monitoring Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2.Social Assessment</td>
<td>2.Evolve policy to regulate groundwater to meet needs of all</td>
<td>2. Develop strategy to involve local communities</td>
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<tr>
<td>No.</td>
<td>Activity</td>
<td>Objectives</td>
<td>Duration</td>
<td>Team</td>
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<td>2</td>
<td>Physical Activity</td>
<td>Recharge to groundwater by various measures and demand control measures</td>
<td>Augment groundwater availability and control extraction of ground water by farmers/stake holders</td>
<td>1. Sustainable development and management of groundwater resources by the community 2. Sustainable agricultural productivity and assured drinking water supply</td>
<td>Monthly</td>
<td>Client / PMU -- RACP</td>
</tr>
<tr>
<td>3</td>
<td>IEC</td>
<td>Educate community and policy makers to address problems and remedies and likely project benefits</td>
<td>Formation of MTGs, GWMC &amp; GWMA</td>
<td>1. Community participation 2. Capacity building for strategic planning</td>
<td>Monthly</td>
<td>DPMU / PMU -- RACP</td>
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<tr>
<td>4</td>
<td>Capacity building</td>
<td>Scientific equipment’/ Training</td>
<td>Enhance the technical skill &amp; capabilities of MTGs, GWMC &amp; GWMA and GWD officers</td>
<td>Strengthen of MTGs, GWMC &amp; GWMA and GWD for effective long term groundwater planning, allocation and management</td>
<td>Monthly</td>
<td>DPMU / PMU -- RACP</td>
</tr>
</tbody>
</table>
Chapter-3
Governance Structures of Community Based Organizations (CBOs)

(a) Multi task group at Village level:
The local community will be mobilised and grouped into Multi Tasks Group (MTG) by NGO.
Membership:

- Ten to Fifteen (10-15) adjoining land owner utilizing ground water will be grouped into one Multi task group (MTG). Head of the family or land holder or his/her nominee from the family will constitute the MTG.
- Separate MTGs can be formed for Small Ruminants Activities having small ruminant (Goat) residing in the cluster area.

(b) Formation of Multi Task Groups (MTGs) at Village level for Small Ruminants Activities

- The Goat farmers are likely to be organized into MTGs@10-15 farmers per MTG. The selection criteria for SR farmers to become the member of MTG would be as follows:
  
  i. Farmer should be preferably though not essentially small or marginal farmer.
  
  ii. Farmer should possess at least 3 goats.
  
  iii. Farmer should be willing to participate in the program
  
  iv. Farmer should be willing to contribute his/her own investment as per pattern of funding.

Elections for the Group Leader of MTG:

- All members of MTG having the right to elect Group Leader and Co Leader of the respective Multi task group.
- Group Leader and Co Leader of the MTG will be elected through secretballot if no consensus between the members of the group for selection of Group Leader.
- The election process will be conducted by the NGO assigned the job of mobilizing the community as per the procedure described above. The DPMU will supervise the entire election process.
- Group Leader and Co Leader will work on honorary basis

Role and Responsibilities of MTGs:

- The Group will meet at least monthly. Decisions of the body shall be based on at least 51% of the total number of group members.
- MTGs will be responsible for all activities related to ground water, agriculture, horticulture, livestock, marketing, value chain etc. and mobilize the community / local inhabitants about the project concept.
- Full details of work done will be shared in the next group meeting. Consultancy Agency will support MTG through respective area Village Level Worker and supervisor.
- MTGs will help the Consultancy Agency in identify the demand and supply side interventions required for sustainable groundwater management in preparation of CACP.
- MTG will have awareness of the progress of implementation of the AAP.
• The beneficiary of the MTGs should be willing to pay upfront beneficiaries contribution in the form of cash/labour/material.

• The MTGs will carry out work in their own fields by arranging labours or as decided by RACP. Assistance from the project for individual activities will be directly transferred from PIA into the bank account of concerning members of MTG. For this, procedure will be specified by the PMU.

(c) Gram Panchayat Level Ground water Management Committees (GWMCs):

All the Ground Water Multi Tasks Groups (MTGs) will be grouped into respective Gram Panchayat level Ground water Management Committee (GWMC) by NGO. This association will be registers under Society Act-1958.

Membership:

• The Group Leader and Co-Leader of the each Multi Tasks Group (MTG) of respective Gram Panchayat will be member of the general body of the GWMC. The general body will elect the GWMC Executive Committee members.

Executive Committee of the GWMC:

• The Executive Committee will consist of the following executive members from the mentioned categories.

Elected:

• Marginal farmer - One
• Small farmer - One
• Large Farmer - One
• Woman Representative - One
• Schedule Caste - One
• Schedule Tribe - One
• Other Backward Caste – One

Nominated:

• Other stakeholders - One
• Landless person – One
• Ward Panch of villages covered in respective GWMC – 2 Nos. (One male & one female) nominated by the Sarpanch of respective Gram Panchayat covered in the cluster area.
  a) If there is no woman eligible for seeking the membership of the GWMC, the woman representative will be co-opted in the executive committee of the GWMC by consensus amongst the executive members.
  b) If there is no SC/ST/OBC/Landless family in a particular Gram Panchayat, the Executive Committee will consist of the members of the remaining categories.
  c) The executive members will elect a chairperson. Chairperson will nominate Secretary cum Treasurer for their respective GWMC.
Elections for the Executive Committee of GWMC:

- All members of the general body of the GWMC can contest election for the members of executive committee. Nominated members will also be a part of executive committee. Executive Committee will consist of total 11 members.

- Each member will vote for all the executive committee members representing different categories as mentioned above.

- All members of the general body of the GWMC will have the right to vote in the election of the Executive Committee of the GWMC.

- Each member of the GWMC will have only one voting right. The election will be conducted by secret ballot.

Elections for the Chairperson of GWMC:

- All the members of the executive Committee of the GWMC will be eligible to contest election of the Chairperson of GWMC.

- All the members of the executive Committee of the each GWMC will have only one voting right in the election of the Chairperson of the Ground water Management Committees (GWMCs).

- Chairperson of the GWMC will be elected through secret ballot if no consensus among the members of the executive committee of GWMC for selection of its Chairperson.

- Chairperson, Secretarycum Treasurer will work on honorary basis.

- The election process will be facilitated by the NGO assigned the job of mobilizing the community as per the procedure described above under the supervision of DPMU.

Role and Responsibilities of GWMC:

- GWMCs will sign a Memorandum of Understanding (MoU) with the PIA based on the standard format to be developed by the PMU.

- The General Body will meet Quarterly basis. Decisions of the committee shall be based on majority of the total number of members present. If required a special meeting may be convened. Consultancy Agency will support in organising meetings. General body will review and approve the progress made under the project.

- The Executive Committee will meet on monthly basis. Decisions of the committee shall be based on majority of the total number of member present. If required a special meeting may be convened. Consultancy Agency will support in organising meetings.

- GWMCs will help the Consultancy Agency in identification of the demand and supply side interventions required for sustainable groundwater management in the planning of CACP and get approval in its general body meeting.
GWMCs will help the Consultancy Agency in preparation of Annual Action Plan at the Gram Panchayat level with the support of GWMCs and submit to Ground Water Management Association (GWMA) by the end of November month for coming year for review, revalidation and consolidation at the aquifer level.

GWMC will follow working norms as provided by PIA /PIU/ PMU - RACP.

Annual Review the accounts including funds flow and expenditure. Full details of the funds received and expenditure incurred on the recharge structure/civil structure along with copy of the running bills will be placed before each meeting of the EC and the proceedings will be recorded as minutes. The Consultancy Agency will train and support the GWMCs in the discharge of these activities.

The groundwater recharges structures and other civil works involves earthwork. These works would be executed by GWMCs.

Each GWMC will maintain following records for each civil works.

i. Approved Technical drawings, design and cost estimate.

ii. Register for hiring of labors & Machinery

iii. Register for procurement of material /receipt of material

GWMCs will open a Saving Bank account in the name of GWMC in the local branch of nationalized bank/ District Co-operative bank. Wherever supporting document demanded by bank should be provided by the PIA/PMU.

Account shall be operated jointly by the two signatories namely Chairperson & Secretary cum Treasurer. This Bank account will be operated as per guidelines of RACP issued from time to time.

All single withdrawal up to Rs.50000/- will be with the joint signature of Chairperson and Secretary cum treasurer of respective GWMC.

All single withdrawal above Rs. 50000/- will be with the joint signature of Chairperson and Secretary cum Treasurer of respective GWMC with the permission/intimation of PIA.

Secretary cum Treasurer of GWMC shall be responsible for maintaining all books of accounts/ records which will be open for inspection by Consultancy Agency/ PIA/ PIU/PMU-RACP /auditors.

One office Community Resource Person will be provided to each GWMC by NGO to support in all the day to day work, maintaining all books of accounts/ and supervision of the works.

Signatory of GWMC will not be allowed to withdraw funds unless the accounts of the previous withdrawal(s) are approved by the Executive Committee of the GWMC.

(d) Aquifer Level Ground water Management Association (GWMA):
All the Ground Water farmers Committees (GWMCs) will be grouped into Aquifer level Ground water management association (GWMA) by NGO. This association will be registers under Society Act-1958.

**Membership:**
- The Chairperson of the each Ground Water farmers Committees (GWMCs) of respective Gram Panchayat falling in Aquifer area will be member of the general body of the GWMA.
- The general body will elect the GWMA Executive Committee members.

**Executive Committee of the GWMA:**
The Executive Committee will consist of the following executive members.

- **Elected**
  - Executive members - 7 nos.
  
- **Nominated**
  - Women Representatives - 2 nos.

- Sarpanch of Gram Panchayat falling in the aquifer area (Cluster) – 2 Nos. (one male & one female) Nominated by respective Panchayat Samitee
  
a) If there are no women eligible for seeking the membership of the GWMA, the woman representative will be co-opted in the executive committee of the GWMA by consensus amongst the executive members.

  b) The executive members will elect a chairperson for the GWMA. Chairperson will nominate Secretary of the GWMA.

**Elections for the Executive Committee of GWMA:**
- All members of the general body of the GWMA can contest election for the members of executive committee. Nominated members will also be a part of executive committee. Hence total 11 members will constitute the Executive Committee.

- Each member will vote for all the executive committee members.

- All members of the general body of the GWMA will have the right to vote in the election of the Executive Committee of the GWMA.

- Each member of the GWMA will have only one voting right. The election will be conducted by secret ballot.

**Elections for the Chairperson of GWMA:**
- All the members of the executive Committee of the GWMA will be eligible to contest election of the Chairperson of GWMA.

- All the members of the executive Committee of the GWMA will have only one voting right in the election of the Chairperson of the Ground water Management Association (GWMA).
• Chairperson of the GWMA will be elected through secret ballot if no consensus between the members of the executive committee of GWMA for selection of its Chairperson.

• Chairperson and Secretarycum Treasurer will work on honorary basis.

• The election process will be facilitated by the NGO assigned the job of mobilizing the community as per the procedure described above.

Role & Responsibilities of GWMA:

a) GWMA will sign a Memorandum of Understanding (MoU) with the PIA based on the standard format to be developed by the PMU.

b) The General Body will meet at least twice in a year. Decisions of the committee shall be based on majority of the total number of member present. Consultancy Agency will support in organising meetings.

c) General body will review and approve the progress made under the project.

d) The Executive Committee will meet on quarterly basis. Decisions of the committee shall be based on majority of the total number of member present. If required a special meeting may be convened.

e) GWMA will ensure that the groundwater recharge structures are well distributed over the entire aquifer area as per the plan and not concentrated in a few pockets.

f) To monitor the available funds are spent on implementation of physical activities, which is crucial to create local ownership.

g) Determine the Community Contribution for maintenance of assets.

h) Plan how the GWMA & GWMCs are to be made self economically and institutionally sustainable over the project period to carry on the project activities after the completion of project. The Consultancy Agency will ensure that the GWMA & GWMCs will economically and institutionally sustainable over the project period.

i) GWMA will have Regulatory power to regulate extraction of Ground Water by installation of measurement devices (water meters) on all ground water withdrawal structures, crop water budgeting and preparation of crop plan for the aquifer area based on the available groundwater recharge very year.

j) GWMA will follow the CGWA guidelines for proposals/requests for Ground water Abstraction in Notified and Non-notified areas for various users.

k) GWMA will work as authority for sustainability of ground water resources. Permission to abstract ground water through any new energized means will not be accorded for any purpose other than drinking water by GWMA.

l) As per CGWA guidelines, Water meter installation on the abstraction structure is mandatory. GWMA will ensure that the weekly water meter reading should be maintained by the farmers/MTGs. Consultancy Agency will facilitate farmers/MTGs through animators and supervisors.
m) GWMA will take technical guidance from concerning line department after completion of the project.

n) The office bearer of GWMA should follow the rules and regulations as prescribed in the Rajasthan Society Registration Act-1958.

o) The office building for GWMA will be hired on rental basis. The preference will be given to the Government building if available.

p) Based on the proposals received from GWMCs and after considering their appropriateness, GWMA will compile Annual Action Plan (AAP) with the support of Consultancy Agency and NGO.

q) GWMA will open a Saving Bank account in the name of GWMA in the local branch of nationalized bank/ District Co-operative bank. Wherever supporting document demanded by bank should be provided by the DPMU. Consultancy Agency will facilitate in opening a bank account.

r) Account shall be operated jointly by the Chairperson and Secretary. This Bank account will be operated as per guidelines of RACP issued from time to time.

s) All single withdrawal up to Rs.5000/- will be with the joint signature of Chairperson and Secretary of GWMA.

t) All single withdrawal above Rs. 5000/- will be with the joint signature of DPM-RACP and Chairperson of GWMA with the permission of DPM.

u) Secretary GWMA shall be responsible for maintaining all books of accounts/records which will be open for inspection by Consultancy Agency/ Client / DPM/PMU-RACP/auditors.

v) Review the accounts including funds flow and expenditure. Full details of the funds received and expenditure incurred on the civil structures along with copy of the running bills will be placed before each meeting of the EC and the proceedings will be recorded as minutes.

w) One office Community Resource Person will be provided to GWMA to support in all the day to day work, maintaining all the records and supervision of the works.
Chapter-4
Financial Management for construction of civil work structures at Cluster Level with the help of Consultancy Agency

Institutional Arrangements:

a) Ground Water Management Committee (GWMC)

After registration of GWMC, the chairman & secretary of GWMC with the help from NGO will open a SAVINGS account in the name of GWMC in the local branch of nationalized bank/ District Co-operative bank. The funds released by the Client for the construction of groundwater recharge structures/Civil structure would be deposited in this account. This Bank account will be operated as per guidelines of RACP issued from time to time.

Respective PIA would issue suitable instructions to the bank for the operation of this account by GWMC. GWMC will not be allowed to withdraw funds unless the accounts of the previous withdrawal(s) are approved by the Executive Committee of the GWMC.

This account shall be operated jointly by the Chairman and Secretary cum Treasurer. Secretary cum Treasurer of GWMC shall maintain all books of accounts/ records which will be open for inspection by Client / DPM/PMU-RACP /auditors.

b) Groundwater Management Association (GWMA)

After registration of GWMA, the chairman & Secretary cum Treasurer of GWMA, with the help of NGO will open a SAVINGS account in the name of GWMA in the local branch of nationalized bank/ District Co-operative bank.

c) Execution of Civil Works:

The groundwater recharge structures proposed by GWMC involves mostly earthwork. These works would be executed by GWMC through the local community. NGO will help GWMC in execution of groundwater recharge structures and rental office buildings for GWMCs and GWMA if required in cluster area.

d) Execution of Individual Works:

Works will be carried out by concerned member(s) of MTGs on individual land. Task assignment for the activities as per pre-defined output based results would be given to the members of MTGs by the concerning PIA.

e) Procurement of Material

This would be purchased as per prevailing Project Procurement Guidelines. Consultancy Agency would help GWMC in preparing technical specifications for the material, obtaining quotations, and its analysis for procurement of material.

f) Monitoring & Supervision of the Works:
The supervision of the works is necessary to ensure technical standards and quality assurance.

I. Consultancy Agency would supervise day to day execution of works executed by GWMCs & individual beneficiary ensures that the works are executed as per approved design & quality specifications. District Coordinator (Ground Water) will check and verify all the civil works structure and ensure that the works are as per the approved action plan and design specifications under the cluster. PIA/PIU will monitor & supervise the works and ensure that the works are as per the approved action plan and design specifications. At least 25% test check of all the civil works structure under the cluster will be mandatory for PIA and 10% test check for PIU.

II. PMU will monitor the progress & quality of works from time to time. At least 10% test check of all the civil works structure under the cluster will be mandatory for PMU.

III. PIA, PIU-GWD & PMU will record his observations in the site register maintained by GWMCs.

IV. PIA would submit his inspection report to the PIU-GWD on 5th and 20th day of every month.

V. PIU-GWD would submit his inspection report to PMU-RACP on 10th and 25th day of every month.

VI. PIA/PIU would also communicate the observations recorded by PD, RACP to Consultancy Agency who would take immediate corrective measures wherever required and report to Client.

g) Checking and recording of Measurement Book:
   i. GWMCs and individual beneficiary will maintain record of works executed by them with the help of Consultancy Agency. All measurement of works will be recorded in standard form of measurement book (MB).
   ii. The MB maintained by the Consultancy Agency would be counter-signed by the chairman & secretary of concerned GWMCs jointly with Consultancy Agency.
   iii. District Coordinator of respective PIA will check and verify the measurement book (MB).
   iv. The MB shall be made available for inspection and verification to the Client.

h) Financial Management:
   i. Release of Funds to the GWMCs and individual beneficiary:
      The payment of bills claimed by the GWMCs and individual beneficiary if any shall be released by PIA on Actual / output basis whichever less is after verification of measurements recorded (MB). The payments will be made on the basis of the approved action plan and only against physical progress measured, duly recorded in MB, verified for correctness of works and at the sanctioned estimated rates by PIA on the basis of BSR finalized by the PMU-RACP.
ii. **Release of Funds to Individual beneficiary (MTGs Member):**

The payment of bills claimed by Individual beneficiary (MTGs Member) shall be released by respective PIA on Actual / output basis whichever is less after verification of measurements recorded in MB. The project fund will be released maximum in 4 tranches. PIA will release tranche on the basis of the approved action plan. The payments will be made only against physical progress measured, duly recorded in MB’s, verified for correctness of works and at the sanctioned estimated rates by PIA on the basis of BSR finalized by the PMU-RACP.

iii. **Payment of Bills to GWMCs & individual beneficiary**

The payment of bills for the groundwater recharge structures executed by GWMCs will be made in maximum four bills of which first three will be running bills and the fourth will be Final Bill. The procedure for payment of running bills to GWMCs will be as follows.

a. **First Running Bill**

a) After actual commencement of work, GWMCs & individual beneficiary will submit the first running bill at the end of second week (after 15 days) from the date of commencement of work. The bill submitted by GWMC & individual beneficiary will have to be WMCs and verified by Consultancy Agency for quantity and quality. District Coordinator of respective PIA will check and verify the measurement book (MB). Within one week from the date of submission of bill by GWMC, the respective PIA will verify the works (including recording of Measurement Books), executed and satisfy himself. PIA will certify the payment of the first running bill submitted by GWMCs. In case of individual beneficiary 20% of his contribution for General Category and 10% for SC&ST category will be deducted from first running bill.

b) Respective PIA will release the payment in the name of GWMCs and individual beneficiary through Treasury Fund transfer in the A/C of respective GWMC and individual beneficiary against the first running bill submitted.

b. **Second Running Bill**

a) Within one month after start of the work, GWMC & individual beneficiary will submit second running bill for the works executed. The bill submitted by GWMC & individual beneficiary will have to be WMC and verified by the Consultancy Agency for quantity and quality. District Coordinator of respective PIA will check and verify the measurement book (MB). Within one week from the receipt of the second running bill the PIA will verify the works (including recording of MB), executed against the First & second running bill submitted by GWMC and certify the payment of second running bill.
b) Respective PIA will release the payment in the name of GWMCs and individual beneficiary through Treasury Fund transfer in the A/C of respective GWMC and individual beneficiary against the second running bill submitted.
c. Third Running Bill

a) Within One month fifteen days after start of the work, GWMC & individual beneficiary will submit third running bill for the works executed. The bill submitted by GWMC & individual beneficiary will have to be WMC and verified by the Consultancy Agency for quantity and quality. District Coordinator of respective PIA will check and verify the measurement book (MB). The respective PIA will inspect the works (including recording of MB), executed against the second & third running bill submitted by GWMC and certify the payment of third running bill.

b) Based on the inspection and verification, the respective PIA will certify the payment of third running bill submitted by GWMC. The respective PIA will release the payment of third running bill submitted to GWMCs through Treasury Fund transfer in the A/C of respective GWMC against the third running bill submitted.

d. Fourth and Final Bill

a) Within two month after start of the work, GWMC & individual beneficiary will submit final bill for payment. GWMC & individual beneficiary will complete the construction of the groundwater recharge structures as per approved design and submit the final bill which will be WMC and certified by Consultancy Agency for quantity and quality. District Coordinator of respective PIA will check and verify the measurement book (MB). Within one week from the date of receipt of the final bill from GWMC & individual beneficiary, the respective PIA will inspect and verify the works executed by GWMC & individual beneficiary and ascertain that the construction of respective groundwater recharge structure has been completed as per design approved by PIA. Thereafter, the respective PIA will certify the payment of the final bill.

b) Based on the inspection and verification, the respective PIA will certify the payment of Fourth & final bill submitted by GWMC & individual beneficiary. The respective PIA will release the payment of Fourth & final bill submitted to GWMCs & individual beneficiary through Treasury Fund transfer in the A/C of respective GWMC against the Fourth & final bill submitted.

e. Work Completion Certificate

After completion of the construction of every groundwater recharge structure/civil structures executed by GWMCs, the Consultancy Agency will submit a Work Completion Certificate for each structure and certify that the work has been completed as per the design approved by PIA/PIU and the quality of work is good for the stability and suitability of the structure. The work completion certificate issued by the Consultancy Agency will have to be countersigned by the chairman & secretary of respective GWMC, District Coordinator (Ground water). This will be verified by respective PIA. Consultancy Agency Client
f. Maintenance of Records

Consultancy Agency will train & facilitate the GWMCs & GWMA to maintain the following records and registers at GWMCs/GWMA level. The accounts of the amount received from Client by GWMC/GWMA and expenditure incurred will be maintained at GWMC and GWMA level accordingly. All vouchers will be maintained by GWMC/ GWMA which will also require for auditing of their accounts.

a) Approved Technical drawings, designs and cost estimates.
b) Register & Bill for hiring of labors
c) Register & Bill for procurement of materials
d) Register for Flow Funds
e) Others

GWMCs will maintain **following registers** to facilitate good governance of financial matters.

<table>
<thead>
<tr>
<th>Type of Book/Register</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| Cash cum Bank Book    | The following will be recorded date-wise -  
|                       | i. Cash contribution in case of individual beneficiary;  
|                       | ii. All bills and vouchers or cash including - Payments to labor,  
|                       | purchase of material and hiring of machinery and other expenditure paid  
|                       | by GWMCs & individual beneficiary |
| Register for payment of Labour | Annexure-C |
| Statement of Fund Utilization | Annexure-D |
| Register for Financial and Physical Progress of work | Annexure-E |
| Monthly statement of expenditure | Annexure-F |
| Register for procurement of material and supply to respective sites | Payment towards purchase of material /hiring of machinery accompanied by the purchase order. |
| Copy of agreement with PIA | To be provided by PIA |
| Copy of approved estimate | To be furnished by PIA |
| Copy of reports on supervision and quality control by Consultancy Agency/PIU/ PIA/PMU-RACP | To be furnished by PIA |
| Copies of all running bills and final bills | Format will be as per State PWD Code |
| Copy of approved technical drawings and designs | To be given by PIA |

g. Reporting
The GWMCs will submit a Statement of Fund Utilization in the format given in **Annexure- C.** The Statement will be submitted along with each running bill. Before submitting the Statement, bank account would be reconciled. The statement will be signed by the Chairperson and Secretary of GWMA verified by the Consultancy Agency and forwarded to the PIA. The statement will be placed before each meeting of the Executive Committee.

**h. Audit**

The GWMCs books/records and Statement of Fund Utilization will be subject to audit by the internal auditors and also by the external auditors appointed by the PMU-RACP. It is the responsibility of the Chairperson and Secretary of the GWMCs to produce the books/records to audit and also to attend to all the audit observations. The GWMCs will submit compliance to the PIA on the audit report within 45 days of receipt of the audit report. Serious audit observations will be taken in account at the time of further release of funds. The audited Statement of Fund Utilization and the audit report shall be displayed at public places by the GWMCs for information of the community. Social audit would be undertaken in the general body of respective GWMC / GWMA once in a year.
Rajasthan Agricultural Competitiveness Project
Check list for Financial Inspection / Monitoring

Name of GWMC ___________    Gram Panchayat

Name of GWMA at Aquifer level__________

Date of Visit_____________    Name of Reviewer_____________

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cash book and bank pass book written up to date (Indicate date).</td>
<td></td>
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<tr>
<td>2. Cash balance reconciles with physical cash in hand. (Do a cash count)</td>
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<td></td>
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<tr>
<td>3. Are Books/records written up to date?</td>
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<tr>
<td>4. All vouchers are serially numbered and filed properly.</td>
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<tr>
<td>5. Bank reconciliation’s has been done as at the end of the previous month. (attach a copy)</td>
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<tr>
<td>6. Stock register for building materials &amp; other goods is up to date.</td>
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<tr>
<td>7. Fixed asset register is up to date.</td>
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<tr>
<td>8. Is Statement of Fund Utilization prepared and submitted up to the previous month/quarter?</td>
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<tr>
<td>9. Does the Statement of Fund Utilization matches with the books and records?</td>
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<tr>
<td>11. Are there any fund flow delays to the Community?</td>
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<tr>
<td>12. Are there any pre-signed blank cheque or large cash withdrawals.</td>
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<tr>
<td>13. Is Labor deployment register up to date</td>
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<td></td>
</tr>
</tbody>
</table>

Signature of Reviewer
Date:

Signature of Approver
Rajasthan Agricultural Competitiveness Project
Checklist for Due Diligence of Running/Final Bills of GWMC
(to be filled up by the Client and attached with each Running Bill)

<table>
<thead>
<tr>
<th>Name of GWMC:</th>
<th>Cluster:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Receipt of Running Bill:</td>
<td>Date of Verification:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Check points</th>
<th>Yes/No/NA</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Running Bill is in prescribed format and all particulars have been duly filled up.</td>
<td></td>
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</tr>
<tr>
<td>2. The Running Bill is signed by Consultancy Agency &amp; counter-signed by Chairperson and Secretary of GWMC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Measurement Book is available &amp; is counter signed by Consultancy Agency.</td>
<td></td>
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<tr>
<td>4. The activity executed is in accordance with the approved action plan/agreement.</td>
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<tr>
<td>5. Photographs of work done have been submitted.</td>
<td></td>
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<tr>
<td>6. Invoices and supporting documents for amount utilized/procured are attached.</td>
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<td></td>
</tr>
<tr>
<td>7. The running bill is accompanied with the Statement of Fund Utilization in prescribed format, duly filled and signed, and verified by Consultancy Agency.</td>
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<td></td>
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<tr>
<td>8. The particulars of the Statement of Fund Utilization match with the subsidiary records at the DPMU.</td>
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<tr>
<td>9. Approval for any variations (cost or time) has been duly obtained.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. In case of the last running bill, Work Completion Certificate signed by Consultancy Agency, Chairperson and Secretary of the GWMC &amp; GWMA, and Counter sign by Consultancy Agency and verified by District Coordinator.</td>
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<td></td>
</tr>
<tr>
<td>11. All audit observations been responded to in a satisfactory manner.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Verified by Subject Specialist Team Leader, Finance Consultancy Agency Consultancy Agency Consultancy Agency
Date:
To be filled by the technical staff recommending the payment and reviewed by Finance Officer at the Client level.
## REGISTER FOR PAYMENT OF LABOR

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of person/member</th>
<th>Family name of member</th>
<th>Total No. of days of work done by member/family</th>
<th>Rate Rs Per day</th>
<th>Total amount due for labor to member/family (Rs.)</th>
<th>Amount paid (Rs.)</th>
</tr>
</thead>
</table>
Annexure-D

Rajasthan Agricultural Competitiveness Project
Statement of funds utilization by GWMC to Consultancy Agency to PIA

<table>
<thead>
<tr>
<th>Name of the GWMC / GWMA</th>
<th>Gram Panchyat</th>
<th>Block</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name/Address of Project Bank Branch</td>
<td>Branch Code</td>
<td>Account No.</td>
<td></td>
</tr>
</tbody>
</table>

Reporting period:

Date of the Statement _/_/_/20_

<table>
<thead>
<tr>
<th>PARTICULARS</th>
<th>UP TO PREVIOUS PERIOD</th>
<th>DURING THE REPORTING PERIOD</th>
<th>CUMULATIVE TILL DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Opening Balances (a+b+c)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Cash</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Bank Balance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Advances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Add: Receipts (a+b)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Funds received from RACP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Interest and other income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. TOTAL FUNDS (A + B)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Project Expenditure

| a. Cement | | | |
| b. Sand | | | |
| c. Bricks | | | |
| d. Steel | | | |
| e. Labor | | | |
| f. | | | |

Sub Total Gross Expenditure (a to f)

D. TOTAL EXPENDITURE(project share)

E. Closing Balances (a+b+c)
## Annexure-E

**RAJASTHAN AGRICULTURE COMPETITIVENESS PROJECT**  
Community Based Aquifer Level Groundwater Management Model

### REGISTER FOR FINANCIAL AND PHYSICAL PROGRESS OF WORKS EXECUTED BY GWMC

<table>
<thead>
<tr>
<th>Name of GWMA</th>
<th>Block</th>
<th>District</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of activity/ type of work</th>
<th>Date of approval by DPMU</th>
<th>Estimated cost (Rs.)</th>
<th>Demand for release of funds by GWMA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td>Date</td>
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</tbody>
</table>

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Chapter-5

Procurement Management

1. General Principal:
1.1 The resources needed to carry out the activity are procured with due attention to economy and efficiency (Lower cost, best quality and timely availability)
1.2 Project funds are used to pay for resources; and
1.3 All suppliers should have an equal opportunity to complete and their selection is carried through most transparent means.

2. The Procurement Process:
2.1 Procurement of all goods, works & services will be carried out in accordance with the World Bank’s “Guidelines: procurement under IBRD Loans and IDA Credits” dated January 2011 (Procurement Guidelines); and” Guidelines: Selection and Employment of Consultants by World Bank Borrowers “dated January 2011 (Consultancy Guidelines) & the agreed procedures described in the Legal Agreement.
2.2 Procurement Manual (PM) of RACP will have prevailing effect on procedure here in after. If any discrepancy arises between procurement guidelines of cluster and PM then the procedure prescribed in the World Bank Guidelines will have over riding effect.

3. Procurement Plan:
No procurement would be made without provision in the approved Procurement Plan. After approval of the CACP, a Procurement Plan will be prepared by PIA in desired format which will include (i) the enlisting of goods and equipment’s (ii) enlisting of items required for works (iii) methods of procurement of goods, works, and non-consulting services (iv) the time schedule, and any other information that PMU may require. Initially eighteen months (18) procurement plan would be prepared which will be revised from time to time. The Procurement Plan would be prepared in following manner:
(a) GWMCs will ascertain & compile the requirement of MTGs & hand over to PIA up to 15th December of every year.
(b) PIA will examine the requirements submitted by GWMCs & prepare a procurement plan in the prescribed format. The Procurement Plan will be submitted to PIU up to 20th December of every year and PIU will forward to PMU up to 31st December of every year.
(c) The PMU will include the plan submitted by PIAs/PIU and prepare a comprehensive procurement plan to be submitted to the World Bank.

4. Procurement Committee:
(i) At GWMC level
(a) Chairperson of GWM C.
(b) Accounts person of PIA.
(c) Team Leader of Consultancy Agency.
(d) Secretary cum Treasurar of GWMC.
(ii) At PIA level:
(a) Head of PIA
(b) Accounts person of PIA.
(c) District Coordinator (Ground Water) - Member Secretary.
5. Responsibility of the Procurement Committee:
(a) Identify the item or the package of items to be purchased from the procurement plan:
- Understand the specifications of the item(s) to be purchased.
- Lay down terms & conditions and specifications.
- Rate Contracts of State Governments are not acceptable, but they can be considered as one quotation & compared with those obtained from other suppliers.
- **DGS&D rate contracts shall be acceptable for procurement under shopping.**
(b) Shop around or call for at least 3 quotations in writing with signature of supplier. (Quotations could also be obtained by Fax). The request for quotations shall contain:
- The description specification and quantity of the goods.
- Say that contract shall be for full quantity of each items.
- Terms of delivery of goods or description of works.
- Desired completion period.
- Place of works.
- The prices shall be quoted in INR
- Each bidder shall submit only one quotation.
- Quotation shall remain valid for a period not less than 15 days.
- Terms of payment.
- Warranty Conditions.
(c) Prepare a comparison sheet to select the most appropriate supplier. Following steps shall be followed:
- Evaluate & compare the quotations determined to be substantially responsive to the conditions to notice for quotation (NIQ)
- Write information from the quotations on a comparison sheet.
- Select the most responsive supplier, who has offered the lowest price, which also commensurate with market price.
- Sales Tax in connection of goods shall be or shall not be taken in account for the purpose of valuation only.
- The procurement committee members should sign on the comparison sheet.

6. Procurement Threshold limits:
Procurements would be done at PIA/PIU level (shopping method for contract < US$1,00,000 i.e. about Rs.60.00 lakhs). **Any procurement larger than shopping will be handled by PMU.**

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Value in (threshold) per contract</th>
<th>Procurement Method</th>
<th>Contracts Subject to Prior Review/Post Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods, equipment and raw material</td>
<td>US$ 1,00,000</td>
<td>Shopping / DGS&amp;D Rate Contract</td>
<td>Post Review</td>
</tr>
<tr>
<td>Civil works</td>
<td>US$ 1,00,000</td>
<td>Shopping</td>
<td>Post Review</td>
</tr>
</tbody>
</table>

7. General Procedures:
(A) Goods: Whenever a purchase under this category is to be undertaken, the following should be considered:

- Properties or characteristics of the item that is to be purchased;
- Quantity required with the unit of measurement;
- Approximate time when the item is required;
- How payment will be made, in lump sum or in installments? (All payments by cheque only)

8. Procurement of Goods & Equipment’s:
- PMU/PIU/PIA will be procured through National Shopping or National Competitive Bidding depending upon the value.

9. Procurement of Services:
Selection of competent consultant or any other essential technical expertise required for implementation of CACP would be done at PMU level.

10. Procurement of Works:
The following should be kept in consideration:
1. Size and location of land/area for construction, or the location of the existing structure for renovation, alteration, refurbishing:
2. Design/sketch/specifications of work.
3. How the payment will be made in lump sum or in installments?
- Farm Ponds on Individual beneficiary in their own lands:
  - In order to conserve soil moisture & water on individual beneficiaries field Farm Ponds would be constructed by the MTG members themselves under control & supervision of Consultancy Agency and PIA on their fields. Every MTG member desirous of conservation work on his field will have to sign Grant Agreement with PIA. Works would be carried out on Performance Based Procurement mode.
- Conservation measures on non-arable lands:
  - Non arable lands falling in the Ground Water cluster which are unproductive would be treated by construction of Contour trenches (V-ditches, Staggered trenches, Ditch cum bund, Pasture development etc. Works would be done by GWMCs on Common/ Panchayat Lands with the support of MTGs under control & supervision of PIA/Consultancy Agency. Works would be carried out on Performance Based Procurement mode.
- Rain Water flow treatment or excess surface water for Artificial recharge:
  - To conserve rain water flowing out of the Ground water Cluster area through drainage lines, treatment with Gully control structures, Concrete & masonry check Dam, Water harvesting structures i.e. Anicuts /Tanks etc as identified in CACP would be done by GWMCs with the support of MTGs under control & supervision of PAI/Consultancy Agency on Performance Based Procurement mode.
  - The procurement committee of the GWMC will procure the materials locally such as cement, sand, boulder stones, pebbles, gravels, steel etc. under the guidance of PIA at the BSR rates or through shopping procedure.

11. Community Procurement:
This provision of the Bank’s Procurement Guidelines has been specifically designed to address procurement in Community beneficiary involved projects. It stipulates that
procedures, specifications and contract packaging shall be suitably adapted to reflect the conditions and capacity of the community, provided they are efficient and acceptable to the Bank. This provision allows flexibility in defining acceptable procedures at the community level. As a general rule, procurement should be designed to:

a) Be simple enough as to be understood and implemented by local staff and the community;

b) Be sufficiently transparent to permit real competition among suppliers and to facilitate control in the selection of contractors and use of funds;

c) Use simple, standardized documentation; and

d) Balance risk versus control/management with efficiency considerations.

The procurement procedures, based on World Bank guidance note for management of procurement responsibilities in community driven development projects, that may be are:

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Value in (threshold (*) per contract</th>
<th>Procurement Method</th>
<th>Contracts Subject to Prior Review / Post Review**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods, equipment and raw material</td>
<td>US$ 20,000</td>
<td>Shopping / DGS&amp;D Rate Contract Price Based on Unit Cost Database(***)</td>
<td>Post Review</td>
</tr>
<tr>
<td>Civil works</td>
<td>US$ 20,000</td>
<td>Shopping/ Force Account (***)</td>
<td>Post Review</td>
</tr>
</tbody>
</table>

* If a transaction comprises several packages, lots or slices, the aggregate, estimated value of contracts determines the applicable threshold amount

**This method is used for equipment and machinery when there is a need to adopt certain minimum standards of specification, technology or a repeat order. To facilitate consistent standards and comparable price ranges, the contract price agreed upon should be based on established estimates by PMU/PIU/PIA as shown in a Unit Cost Database. These databases will be maintained by the PMU/PIU/PIA after carrying out a Floating of Enquiry (FOE). The UCDs should be kept updated and valid and can be useful for communities in the preparation of proposals and in assessing whether a specific supplier is offering a —fair‖ price.

***Under a community force account, the community implements the subproject using its own resources (skilled and unskilled labor, materials, equipment), and may subcontract part of the subproject. This approach offers several advantages. It is community driven and cost effective (inputs can be provided by the community at below-market costs), and it injects funds into the community (e.g., through the payment of wages and materials).
FORMAT FOR INVITATION OF QUOTATIONS FOR SUPPLY OF GOODS/ MACHINES/EQUIPMENT/MATERIALS UNDER SHOPPING PROCEDURES

Ref. No. _________________  Dated _________________

To_____________________________
_____________________________
_____________________________

Dear Sir/Madam,

Sub.: INVITATION FOR QUOTATIONS FOR SUPPLY OF:

________________________________________________________________________

1. You are invited to submit your most competitive quotation for the following goods:-

<table>
<thead>
<tr>
<th>Brief Description Specifications*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Delivery/ Place of Installation of the goods | Period Delivery Requirement, if any

________________________________________________________________________

* Where ISI certification marked goods are available in market, procurement should generally be limited to goods with those or equivalent markings only.

2. Government of India has received a credit from the International Development Association (IDA) i.e. World Bank.

Towards the cost of the above procurement, the Project intends to apply a part of the proceeds of this credit/loan to eligible payments under the contract for which this invitation for quotations is issued.

3. BID PRICE

a) The contract shall be for the full quantity as described above. Corrections, if any, shall be made by crossing out, initialing, dating and rewriting. b) All duties, taxes and other levies payable by the contractor under the contract shall be included in the total price. c) The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account. d) The prices shall be quoted in Indian Rupees only.

4. Each bidder shall submit only one quotation.
5. VALIDITY OF QUOTATION

Quotation shall remain valid for a period of not less than 30 days after the deadline date specified for submission.

6. EVALUATION OF QUOTATIONS

The purchaser shall evaluate and compare the quotations determined to be substantially responsive i.e. which are properly signed; and confirm to the terms and conditions and specifications. The quotations would be evaluated for all the items together / would be evaluated separately for each item. [Select one of the options].

7. AWARD OF CONTRACT

The purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

7.1 Notwithstanding the above, the purchaser reserves the right to accept or reject any quotation and to cancel the bidding process and reject all quotations at any time prior to the award of the contract.

7.2 The bidder whose bid is accepted will be notified of the award of the contract by the Purchaser prior to the expiration of the quotation validity period. The terms of the accepted offer shall be incorporated in the purchase order.

8. Payment shall be made within --- days after delivery, installation and/or training, if applicable, of the goods.

9. Normal commercial warranty / guarantee shall be applicable to the supplied goods.

10. You are requested to provide your offer latest by _____hrs. on __________(date).

11. Quotations will be opened in the presence of the Bidders or their representatives who choose to attend at _____AM/PM on ______________ in the office of the __________________

12. We look forward to receiving your quotations and thank you for your interest in this project.

(Purchasing Authority)

Name: _______________________
Address: ______________________
________________________
________________________
Tel. No. : ______________________
Fax No. : ______________________
FORMAT OF QUOTATION*

(In letterhead of the supplier with seal)

To:

Date ________

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Item</th>
<th>Unit Quoted</th>
<th>Rate Quoted in INR</th>
<th>Numbers Quoted</th>
<th>Total Price</th>
<th>Delivery within days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Gross Total cost: Rs. ______________

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. ______________ (Amount in figures) (Rupees ______________—amount in words) as per the delivery schedule given in Quotation above.

We also confirm that the normal commercial warranty/ guarantee of ______________ months shall apply to the offered goods.

We confirm that the above offer is valid for ---- days.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in fraudulent or corrupt practices.

Signature of Supplier

Name: __________________

Contact No: ____________

(Seal)
Format for opening of bids/quotation

File No. ------------------- Date & Time of quotation opening -------------------

Bid issued for ____________________________________________________________

Bid issued on _____________________

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name and address of the Bidder</th>
<th>Total Price in Rupees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

*It is certified that the above details were called out publicly in our presence:*

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the representative</th>
<th>Agency</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Signatures of Bid Opening Committee Members

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Officer</th>
<th>Designation</th>
<th>Signature</th>
</tr>
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<tbody>
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</tbody>
</table>

Minutes of the meeting (questions /clarification sought by the agency and the clarification given)

Signature                                Signature                                Signature
(Member Name)                            (Chairperson Name)                    (Member Name)

Date:                                    Date:                                    Date:
Format for Comparison of Quotations/Bids

<table>
<thead>
<tr>
<th>Name of firm</th>
<th>Quotation No. &amp; Date</th>
<th>Name of Item/s and (Price quoted) Rate</th>
<th>Remark (Additional Information)</th>
<th>Decision (Selected/Rejected with Reason)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item A</td>
<td>Item B</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price A</td>
<td>Price B</td>
<td></td>
</tr>
</tbody>
</table>

Signature of
Member 1       Signature of
Member 2       Signature of
Member 3       

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