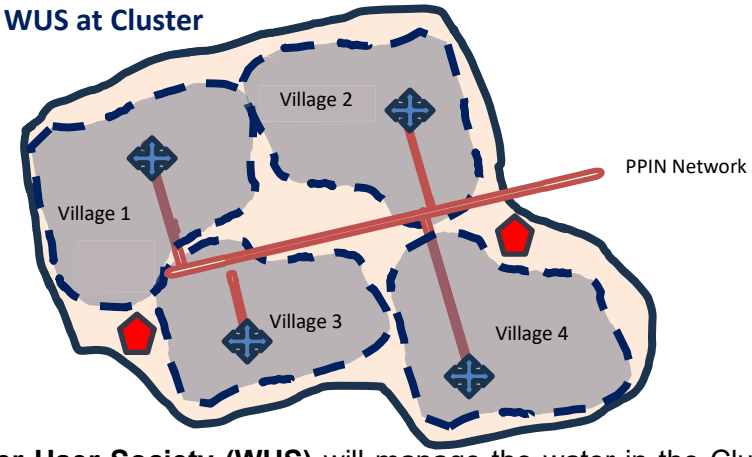
Principle 1 – Cluster as the working level in the Command Area. The large command area will be divided into clusters. The size of the cluster may vary from 50 ha (for small states) to a maximum of 5000 ha (for large states). The size of the cluster determines the economic strength of the Water User Society. It can be a administrative boundary for convenience and will incorporate the full administrative boundary of the village for ease of managment. The convergence of all Government sponsored benefit schemes can be done at cluster level.



Principle 2 – The **Water User Society (WUS)** will manage the water in the Cluster. It will receive the bulk water from the Department and charge its members It can be constituted under Society Registration Act 1860, Co-operation Act etc. as suitable to State. The WUS will be subject to Annual Audit by the Government. The WUS will have a elected voluntary hierarchy system something like::

At maximum size: 5000 ha Cluster: *headed by Pani Pradhan (PP)*

At 1000 ha Division: *headed by Deputy Pani Pradhan (DPP)*

At 300ha (Village / Zone) : *headed by Gram Pani Pradhan (GPP)*

At 30 Ha Chak for Chak Committee (CC) : *headed by Chak Pani Pradhan (CPP)*

At 5 ha Sub Chak Committee (SCC) : *headed by Jal Mitra (JM)*

Principle 3: All the water sources in the Cluster will be **Integrated**. This may include the community GW well, Canal water, Minor Irrigation structures, community ponds, available recycled water. This will ensure year around water for 2/3 crops and full utilization of the PPIN assets

Principle 4 – The water supply for irrigation from integrated sources shall be able to deliver at **Water Use Efficiency** of 75% and above through underground Pressurized Piped Water Network. The farmers will use water efficient methods like micro irrigation or community-based center pivot systems for farming.

Principle 5 – Water Accounting through use of technology like SCADA, IoT and link up with satellite ET based Water Management system to ensure operational Water Use Efficiency at all crop seasons.

Principle 6 – For **Irrigation as a Service**, the construction contractors will be roped in as Irrigation Service Providers (ISP) with long term contracts (5 years and above) and report to the WUS

Central Government	• Funding and monitoring of the scheme at the Central level. • Finalization of the Clusters for the Program • Technical Support to the State Government(s) • Setting up of National Program Management Unit (NPMU) for effective Data Management for India Irrigation Management System (IIMS) • Sharing Cross State learnings, documentation of good practices
State Government	• Identify the Nodal Implementing Authority which will co-ordinate with all Departments and set up State Program Management Unit (SPMU) • Setting up the State Level steering Committee under Chief Secretary • Identification of the Clusters for the MCAD program • Aid the formation of WUS before start of MCAD Infrastructure • Arrange State Nodal Officer for SNA-Sparsh and arrange state share of funding • Ensuring adequate power structure for Pump Station at Canal • Identification and integration of all available water sources within the cluster (GW/ SMI/RRR/ Tanks/ Reused Water) for maintaining supply for 2 or 3 crops • Engage in signing of the 3- or 4-Party MoU as per SoP before start of the MCAD implementation in the cluster • Arrange the EPC contract with inbuilt O&M and service delivery for 5 years with preferably 40% payment staggered during the O&M period. • Arrange the Irrigation management Transfer to WUS after construction completion and manage the bulk supply of water with measurements at the entry to Cluster • Share the SCADA/IoT data with NPMU • Arrange for the removal of any legal or executive impediments for the success of MCAD Program • Arrange for Annual Audit of the WUS
District Level	• Issue of the Executive Order for identifying the Cluster and Formation of the Water user Society (WUS) as per Model MoA SoP • Arrange for Irrigation Management Transfer • Ensure convergence of all applicable Government schemes to be extended to cluster on priority • Support the Farmer Relationship Agency (FRA) in the capacity building of the WUS in its development as economic entity or link up with FPO opr PACS.
Water User Society	• All occupiers in cluster to pool membership seed fund for WUS with Aadhar Identification • Engage in social monitoring of the infrastructure • Collect O&M Charges from the members, bear energy charges during O&M period, manage the Irrigation Service Provider • Engage the members of WUS for training in economic activities to become financially independent. • Engage in the subsequent maintenance, modernization, upgradation of the PPIN system through its own resources with no support of the central Government after hand holding period of 5 years • Continue disclosing water accounting for IIMS Portal

A. MCAD will bring benefits at individual level:

1. Enhanced Crop Production: With clubbing of the water sources, PPIN may ensure year-round cultivation, which will increase crop yields and surplus for sale.
2. Diversification of Crops: Farmers can grow different crops, including high-value ones, boosting income diversity.
3. Employment Creation: Setting up and managing PPIN systems will facilities generate local job opportunities.
4. Steadier Income: Stabilized PPIN will ensure consistent crop yields, stabilizing farmers' earnings.
5. Improved Market Access: Better training and confidence building with marketing facilities will enable farmers to sell their produce at competitive prices, increasing income.
6. Value Addition: Farmers may engage in processing or packaging, adding value to their produce for higher returns.
7. Local Economic Growth: Increased farmer income stimulates spending in local communities, generating more business and employment for associated accessories like mini tractors, drones, Agri robots etc.
8. Energy Saving: With PPIN, the need for putting diesel pump/ electric pump to draw water from canal or GW will cease. The Overall savings in the energy bill of the Farmer.
9. MCAD provides for exposure visit of the Farmers to successful clusters/ areas and continual confidence build up by handholding for 5 years after the erection of the PPIN system in the cluster.
10. The saturation of Cluster with all the Govt. schemes, or with CSR initiatives will bring additional benefits to the Farmer.
11. Farmer Centric: All grievances of the farmer will be dealt by the Water User Society

B. MCAD will bring benefits at Community Level with Water Users Society (WUS)

1. MCAD will lead to the sense of ownership and leadership by the farmers through WUS in themselves. With better awareness and empowerment, the WUS will be better equipped to reap the benefits of government welfare schemes and be able to create a new business environment to take up lucrative economic activities along with employment generation in the rural IT sector.
2. Collective Decision-Making: WUS allow farmers to actively participate in the planning, operation, and maintenance of irrigation infrastructure, ensuring that their needs and concerns are addressed.

3. Water Allocation and Distribution: WUS are responsible for the fair allocation and distribution of water among the participating farmers. They establish rules and regulations to ensure equitable access to water resources, considering factors such as crop water requirements, seasonality, and the size of landholdings.
4. Operation and Maintenance: WUS take charge of the operation and maintenance of irrigation infrastructure, such as canals, pipes, and pumping stations. They organize regular maintenance activities, monitor water flow, and address any issues or repairs required, ensuring the efficient functioning of the irrigation system.
5. Conflict Resolution: WUSs act as mediators in resolving conflicts or disputes among water users. They provide a platform for dialogue and negotiation, helping to address disagreements related to water allocation, scheduling, or infrastructure usage. This fosters cooperation and harmony among farmers, reducing conflicts and promoting sustainable water management.
6. Capacity Building: WUS facilitate capacity building among their members by providing training and technical assistance. Farmers receive guidance on water-efficient farming practices, crop selection, irrigation scheduling, and water-saving techniques. This empowers farmers with the knowledge and skills necessary to optimize water use and improve agricultural productivity.
7. Financial Management: WUS manage the financial aspects of the irrigation project, including the collection of water charges or fees from the participating farmers. They ensure transparency and accountability in financial transactions, maintaining records and utilizing funds for operation, maintenance, and future development of the irrigation system. They will be encouraged to link with existing FPO/FPC/PACS
8. Collaboration with Stakeholders: WUS serve as intermediaries between water users and various stakeholders, including government agencies, NGOs, and research institutions. They represent the interests of farmers, advocate for their needs, and collaborate with external organizations to access resources, technical expertise, and funding for the development of irrigation projects
9. MCAD provides for one-time matching grant of Rs. 50 Lakhs to the WUS to start of the Economic Activities. The Performance Linked Incentives have also been provisioned for WUS.
10. MCAD provides for creating infrastructure for WUS office cum training building which can be a permanent ground for organizing local exhibitions, technical workshops in association with the Agricultural Universities.
11. Under MCAD Automation of PPIN with established technologies like Internet of Things (IoT) to increase Water Governance and to achieve On Farm Water Use Efficiency WUE up to 90%.

12. Under MCAD steps will be taken for social upliftment towards free market regime. WUS will be roped into the project construction from the start, do social monitoring of the Project and ultimately lead to owning the Irrigation Assets through Irrigation Management Transfer (IMT).
13. Under MCAD the Irrigation Departments' focus will be on quality of water delivery Service. Now the O&M collection will be on Volumetric basis at the inlet to cluster. The Water Fee Collection from the WUS will be easier, corruption free and efficient.
14. MCAD will provide the new paradigm shift in the State Government thinking about source of water as one water approach will link up GW/SW/Reused Water and integrate many departments like Agriculture, Horticulture, CAD, Water Resources at Cluster Level.
15. MCAD may boost in rural economy with demand for other accessories. With WUS as Economic Entities, overall Startup boost for irrigation/Agri sector, local jobs, rural economy booster is expected.
16. Under MCAD WUS can explore in future: private finance through Public Private Partnership (PPP) / Public Private People Partnership (4P) in the cluster.

MCAD SoP B4	Selection of Cluster in MCAD	Ver 5.25

A. Approaches for Cluster selection

1. **Area based approach:** The cluster may be aligned to the administrative boundaries of group of village or block, to utilize the capacity, accountability and legitimacy of existing administrative hierarchies.
2. **Master Plan, Convergence and Saturation approach:** A cluster may be a part of a master plan prepared for some scheme. The scheme may be for water management, development of water sources or water conservation, harvesting and recharge, distribution network, efficient farm level application, demand management, participatory governance, extension services on new technologies, convergence of schemes such as SMI/ RRR component of PMKSY, watershed development component of PMKSY, creation or restoration of water bodies under MGNREGA, Micro Irrigation under RKVY and Micro Irrigation Fund, PM-KUSUM scheme for farmers, Ground water schemes etc. The saturation approach can be adopted in case funding is not available from the relevant scheme for the cluster, provision of funds will be considered under MCAD scheme within the overall allocation for MCAD works.
3. **Programmatic and Projectized approach:** A detailed plan for various programmatic and project interventions may be planned in line with the funding position, objective output, milestone position and timelines for various activities in a large project. This may cover some of the clusters sequentially or simultaneously in a large command area.

B. The Ideal Candidate under Challenge Funding (CF) will be

1. Cluster falling under water short region, mid-section of the Distributary
2. Cluster carry advantages under saturation, projectized, or area-based approach
3. The Agro climatic region support high Agriculture productivity in case sufficient irrigation is provided.
4. Agri Economic markets or facilities are nearby
5. The irrigation source or canal water supply is adequate for 2/3 crops
6. The farmers in the Cluster are progressive, energetic and enthusiastic to from the Water User Society and to adopt Micro irrigation and innovations.
7. WUS in legal form exists in the cluster
8. Cluster chosen for innovative financing through PPP

MCAD SoP B5	Cost of Activities under MCAD	Ver 6.25

Header	Activities Eligible for Funding	Estimated cost (in Rs./Ha)
NON-STRUCTURAL COMPONENT		
NS1	State Level: State Project Management Unit with Experts, Farmer Field Training , Demonstrations & Implementation of Community Irrigation System etc.	7,500
NS2A	WUS Level: Matching Grant to WUS up to Max 50 Lakh, Agency Management Fees for Beneficiaries Capacity building, Awareness of all Government schemes, handholding Support to WUS for development of WUS as FPO/FPC etc., till the end of O&M period of 5 years	7,500
NS2B	Provisions for credit support for PPP Model	1,500
	Sub Total (Non-structural)	**16,500**

STRUCTURAL COMPONENT		
S1	Survey, Planning and Design	2,500
S2A	System level improvements u/s up to Distributary level of the automation or infrastructure improvement	22,500
S2B	Improvement of Water Logged, Saline lands etc.	
S2C	Clubbing of water resources for PPIC (reused water, existing pond or ground water source etc.)	
S3	Construction of Pump House, Irrigation Management Command and control centers at 300 ha/ 1000 ha/5000 ha level (Civil Works and Porta structure)	6,500
S4	Establishment of Communication network and cloud based Automation Command Centers	13,500
S5	Electro-Mechanical works (Pumping Machineries. Electrical substation and accessories), Primary filtration system, and Surge Protection system without transmission line	15,000

S6A	**Primary Pipeline Network** from water source to 300 ha Village Management System (VMS) outlet without Farm Pond.	47,000
S6B	**Secondary Pipeline Network** from 300 ha Village Management System (VMS) outlet to 30 ha OMS Chak outlet without Farm Pond.	55,000
S6C	**Tertiary Pipeline Distribution** from 30 Ha OMS outlet to each 1 Ha manual Valve without Farmer MI system	13,500
S7	**Operation and Maintenance** of five years (@1% per annum)	8,000
	Sub Total (Structural)	1,83,500
Total Cost (60 C 40S)		**2,00,000**

Notes:
1. NS2, S2 and S6 are cafeteria optional to States
2. GST part of the works shall be absorbed by the States except for central component (CC)
3. The cost of temporary land acquisition by the right of way method shall be borne by states
4. Land Cost if any will be borne by State or WUS

Explanations:

Non–Structural Component

NS-1: State Level:

1. **State Project Management Unit (SPMU) with Experts:**
   Experts in hydrology, engineering, and agriculture collaborate to design and implement innovative solutions for optimizing water use. The SPMU also focuses on capacity building, farmer participation.
2. **Farmer Field Training & Demonstrations:**
   Organize hands-on training sessions for farmers on water management, soil conservation, and crop diversification. Set up demonstration plots to showcase advanced irrigation techniques like micro-irrigation with drip systems & sprinkler systems. Conduct workshops, interactive sessions, and exposure visits to educate farmers on best practices.
3. **Implementation of Community Irrigation System:**
   The implementation of a Community Irrigation System for the Modernization of Command Area Development (MCAD) will be achieved by pooling of resources by farmers to manage, operate, and maintain the irrigation infrastructure collectively. This includes psychological skills training, behavioral changes and mental skills training, technical guidance to improve cognitive abilities and confidence build up is targeted under MCAD to help strengthen WUS, empowering farmers to take ownership of their irrigation systems.

NS-2A: WUS Level:

1. **Matching Grant to WUS up to Max 50 Lakh:**

   This is for encouraging the WUS members to pool their resources and develop a sense of ownership towards the society. The more they collect money the more they are incentivized under MCAD. One-time grant to the WUS up to the maximum od Rs. 50 Lakhs (C/S 60:40/90:10) will boost up the corpus fund of the WUS. This fund can be utilized by WUS for any economic activity.

2. **Agency Management Fees for Beneficiaries capacity Building, Awareness of all Government Scheme, handholding support to WUS for development of WUS as FPO/FPC etc., till the end of O&M period of 5 years:**

   A Farmer Relationship Agency (FRA) Management Fee is provided to support beneficiary capacity building, awareness of government schemes, and handholding assistance for Water User Societies (WUS) in their development as Farmer Producer Organizations (FPOs) or Farmer Producer Companies (FPCs). The agency also facilitates access to subsidies, schemes, and market linkages. The FRA will start working with the erection of Infrastructure and will continue to support the WUS till the end of Operation & Maintenance (O&M) period of five years.

NS-2B: Provision for credit support for PPP Model:

A token provision for credit support for the interest part of the Private Finance is provided, in order to manage private entity's risk exposure to minimal under different PPP models.

STRUCTURAL COMPONENT

S-1: Survey and Design

This component will include Command area survey, Survey for pipe line network, design for pipe line network & automation, Preparation of Detailed Design Report, Site Verification by the Consultant and post erection design verification on as built system.

S-2A: System level Improvements u/s up to Distributary level of the aging infrastructure

This involves installation of automation or infrastructure improvement, for making available the water at the Canal pump house for the designated cluster.

S-2B: Improvement of Water Logged, Saline lands

This provision is provided for improvement of surface drainage including reclamation through drainage, sub surface drainage or bio-drainage through deep-rooted vegetation, land leveling, and soil amendment techniques requirements for the success of MCAD in the otherwise successful cluster.

S-2C: Clubbing of Water resources for PPIC (reused water, existing pond or ground water source

Multiple water sources are planned to be clubbed under MCAD. This includes the treated wastewater, integration of existing SMI/RRR, MGNERGA developed ponds with canal water. The whole water planning is required to capitalize the Asset Utilization of MCAD throughout the year. The provision can be utilized for laying connecting pipelines to different sources and their integration into the design of pipe network.

S-3: Construction of Pump House, Irrigation Management command and control centers at 300ha/1000ha/5000ha level(Civil Works and Porta structure)

The provision is for civil works without any land cost. A pump house will be built on canal for maximum of 5000 Ha area. The area of pump house will depend on the capacity and number of pumps required. These structures facilitate the lifting of water from Source, and its distribution through pipelines. The holding storage time for current VT pumps is around 3 minutes so small pump house can be created. Irrigation Management Command and Control Centers may be established at 300 ha, 1000 ha, and 5000 ha levels as part of MCAD. These centers will be portable structures. These structures Equipped with SCADA-based automation, GIS mapping, and digital dashboards, they facilitate real-time data collection, water flow monitoring, and decision-making for optimized irrigation.
S-4: Establishment of Communication network and cloud based Automation Command centers
This involves setting up IoT-enabled sensors, and wireless networks for real-time data transmission. Advanced SCADA systems are integrated to automate water distribution, control pump houses. A centralized cloud-based platform stores and processes irrigation data. Digital dashboards provide real-time monitoring, automated alerts, and remote access to optimize irrigation schedules and detect issues like leakages or inefficiencies.
S-5: 1.Electro-Mechanical works (Pumping Machineries. Electrical substation and accessories)
The modernization of Command Area Development (CAD) includes electro-mechanical works such as the installation of pumping machinery, electrical substations, and necessary accessories to ensure efficient water distribution. High-capacity pump sets, motors, VFD and automated control systems are deployed to lift and convey water efficiently. Electrical substations, including transformers, switchgear, and power backup systems.
2. Primary Filtration System
It involves the Supply and installation of Automatic filters, inlet/outlet Media filter, with manual back wash assembly as per BIS/ International code with all accessories and shall be provided with measuring points at inlet & outlet for pressure measurement and with backup strainer filter etc.
3. Surge Protection system without transmission line
It involves the Supply and installation of hydraulic pressure relief valve with accessories for pressure regulation of irrigation system as per BIS/international standard. Including all fittings/accessories required. Fixing air valve, coupler etc.
S6A: Primary Pipeline Network from water source to 300 ha Village Management System (VMS) outlet without Farm Pond
It involves construction of underground pressurized pipe distribution network from 5000 to 300 Ha chak for micro irrigation system to facilitate pressurized irrigation.
S6B: Secondary Pipeline Network from 300 ha Village management system (VMS) outlet to 30 ha OMS Chak outlet without Farm Pond
It involves construction of underground pressurized pipe distribution network from 300 Ha to 30 Ha chak complete with
S6C: Tertiary Pipeline Distribution from 30 Ha OMS outlet to each 1 Ha manual Valve without Farmer MI system
It involves construction of underground pressurized pipe distribution network from 30 Ha to outlet to 1 ha. (including SCADA, valves, bends, manifolds, controls, Outlet Management System (OMS), outlet with manual valve at one hectare.
S7: Operation and Maintenance of five years
This includes regular inspection, servicing, and repair of pump houses, filtration systems, pipelines, and electro-mechanical components for five years. Regular calibration and software updates for SCADA-based control centers, IoT sensors and cloud-based monitoring systems for real-time irrigation management. Ensuring proper functioning of wireless communication networks, digital dashboards, and automated alert systems and data upload on the cloud software.

MCAD SoP B6	Performance Linked Incentivization's (PLI)	Ver 6.25

PL I No.	PLI Indicator/ Verification Protocols	PLI%
A	**Incentives to States**	
1	Early Completion of Work	35
2	Arranging Minimum 75% Micro Irrigation by Farmers	25
	Sub-Total	**60**
B	**Incentives to WUS**	
1	Setting up Digital Office of the WUS and Efficient collection of water charges for one year	10
2	Arranging Minimum 75% Micro Irrigation by Farmer Members	20
3	Development / linking of WUS as FPO/FPC within one year	10
	Sub-Total	**40**
	Total	**100**

Example:

Total Amount Earmarked for PLI (@10% of A&OE) = ₹ 10 Cr.
For 15 projects, PLI per project = ₹ 0.66 crore
For B2 the maximum incentive to WUS is ₹ 13 Lakhs

PLI Verification Protocols:

1. Verification and monitoring assessments will be carried out by NPMU
2. Success of the protocols for all the PLIs will be based (a) 90-100 % coverage of WUS members (b) Innovative measures adopted

N-19011/1/2024-O/o SJC-I (CAD)-MOWR

I/91656/2024

Government of India
Ministry of Jal Shakti
Department of Water Resources, RD & GR
CADWM WING

299, 2nd Floor, F-Wing
Krishi Bhawan, New Delhi

OFFICE MEMORANDUM

Sub: Constitution of Working Group for effective convergence of modernization of Command Area Development and Water Management (CADWM) component of PMKSY with Per Drop More Crop (PDMC) and other schemes of MoA&FW.

In pursuance to the Record of Discussion held in Krishi Bhawan on 19.12.2023 on the convergence of modernization of CADWM component of PMKSY with Per Drop More Crop (PDMC) & other schemes of MoA&FW under the joint chairpersonship of Secretary (A&FW) and Secretary (DoWR, RD&GR), the following Working Group is hereby constituted:

i. Joint Secretary (NRM/RFS), DoA&FW
ii. Commissioner (CADWM), DoWR, RD&GR
iii. Director (Marketing), DoA&FW
iv. Representative from NABARD
v. Sr. Joint Commissioner (CADWM), DoWR, RD&GR as Member-Secretary

2. The Terms of Reference (ToR) of the Working Group shall be as under:

i. To work out the modalities for linking of modernization of CADWM works with all MoA&FW schemes for adoption of Water Use Efficiency in canal irrigated commands with the Water User Societies as the focal point.
ii. To formulate the SOP of implementation as well as MoU between MoJS and MA&FW.
iii. To revisit the operational guidelines of PDMC and make recommendation for revision, if required.
iv. To identify 2-3 pilot programs in different geographic regions to be implemented under PDMC/PMKSY on urgent basis.

3.The Working Group may co-opt additional experts as invitees to its meetings as deemed necessary from time to time without any financial implications.

4.The Working Group shall meet at regular intervals as decided by the group itself.

5. This issues with the approval of Secretary (DoWR, RD&GR), MoJS.

Signed by Bhaskar Bishnu Saikia
Date: 06-01-2024 22:40:31
Reason: Approved

(Bhaskar B Saikia)
Sr. Joint Commissioner (CADWM)
Ph. 011-23388977

To:
Members of the Working Group

MODERNIZATION OF COMMAND AREA DEVELOPMENT WORKS (MCAD) SCHEME

PROPOSAL REPORT (PR)

Will be the First Report Submitted by State Entity for Initial considerations for the Empowered Committee under by Challenge method

Name	
Designation	
STATE	
DEPTT.	
DATE SUBMITTED	

1. Basic Details

a.	Name of the MCAD Cluster	
b.	Geo location and Geo coordinates Name of Blocks/ Villages served by the Project	
c.	Geographical Area CCA of the Cluster	
d.	Name of Nodal Department/ Agency implementing the MCAD Project. along with the Organizational Structure, name, designation, address, phone, fax and e-mail of concerned Officials: a. PS/Secretary/AS/JS/DS level b. Chief Engineer level c. SE level officers	
e.	Financial source of MCAD project at State level. Whether State funds or through loans or through corporations.	
f.	BE Provisions kept	
g.	Proposed Time Schedule for MCAD works:	Non-Structural Activity: (Start time) (End time) Structural Activity: (Start time) (End time)

2. Irrigation Development of the State and Broad Picture

This section will highlight the

a. General development of irrigation in the State: Storage Projects, CCA catered, CADWM status
b. Projects like MCAD undertaken by the state.
c. Process of Irrigation Water Charges/ Tariff collection from the farmers, the rates of water tariff, the extent of tariff collection in the state
d. O&M policy for irrigation projects being adopted by the State Government
e. State's commitment for promotion of Farmers Managed System and transfer of control and management of MCAD assets to the Water Users' Societies.

3. MCAD Cluster Details in brief:

This would briefly give the data on the following aspects for the cluster:

a. Physiography covering (a) climate, rainfall, location of rain gauge stations, equipment's installed (b) temperature - maximum, minimum of all zones of project area with data (c) mean wind speed and their variations and (d) mean relative humidity. Agro Climatic zone.
b. Topography

c. Soil survey irritability and land-capability classification; soil maps
d. General water availability giving hydrological conditions of the area, rainfall characteristics, ground water. Information
e. Location of the cluster at head/tail of mid section of the canal.
f. The established source of water for MCAD, clubbing of various water sources (Reused Water, GW, SMI/RRR)
g. Availability of cadastral map of the Cluster and its details
h. Demographic Information in the format:

Information regarding marginal (up to 1 ha), small (1 to 2 ha), medium (2 to 10 ha) and large (more than 10 ha) farm holdings:					
Information on farm holdings	Marginal	Small	Medium	Large	Total
Number of farm holdings					
Total CCA Coverage of farm holdings					
Information regarding weaker sections of the farming community:					
Information on farming community	SC	ST	OBC	General	Total
Number of farm holdings					
Total CCA Coverage of farm holdings					

i. Characteristics of the farmers in the Cluster as progressive, energetic and enthusiastic to from the Water User Society and to adopt Micro irrigation and innovations.
j. Existing Water User Society for the Cluster (not outlet level WUA) , if any
k. Command area map of cluster clearly showing waterlogged area/ saline area in landholdings, etc should be provided.
l. Cropping Pattern in the cluster:

Cropping pattern (in terms of CCA covered, including that through micro-irrigation):								
Crop name	Originally envisaged				Presently proposed			
	Kharif	Rabi	Perennial	Total	Kharif	Rabi	Perennial	Total
1.								
2.								
Total								

m. Intensity of Irrigation

Intensity of irrigation (Crop-season-wise and annual):				
Irrigation Intensity (in percentage)	Kharif	Rabi	Perennial	Total
As Originally envisaged				
As Presently proposed				

n. Micro Irrigation in the Cluster

Details of Coverage of Micro Irrigation use by the Farmers in the Cluster		
Sub Cluster	CCA	Micro-Irrigation Area
1.		
2.		
Total		

o. Possibility of the PPP partnership with the private sector in the cluster, if any

p.. Convergence requirements of PDMC/RKVY component of MoA&FW for improving overall water use efficiency in the cluster

q. Details of the Convergence of schemes in the cluster from other Ministries of Government of India or from the State Schemes. These schemes should have no overlap in funding for the same activity/ component

r. Agri Economic situation in the cluster, like Agri Markets, Food factories etc.

4. Outline of Activities Targeted Under MCAD

a. Proposed activities under the Scheme components – namely: (i) Non-Structural (NS1 and NS2); and (ii) Structural (S1 to S7) (refer SoP on Cost of Activities) – and provide justification for taking up of each activity in light of facts presented in earlier chapters.

b. The requirement of any additional activity, which is not covered under MCAD but is essential for the success of overall program, may also be detailed here along with details of cost implication. This cost will be borne by the State.

c. Any variations proposed in the scope or implementation methodology of the activity included under MCAD may be highlighted.

d. State Project Management Unit Details

5. Annexures

Various maps/ layouts/ engineering drawings, elaborately tabulated data/ spread sheet or any other information

6. Undertaking

The focal point of MCAD project will be Irrigation Management Transfer (IMT) and Farmer Managed System (FMS) through Water User Society (WUS) An undertaking in this regard, duly signed by the Principal Secretary of the concerned Department, will have to be given as per below given format to indicate the seriousness of the State Government for MCAD principles:

UNDERTAKING

(To be given by the Principal Secretary of the concerned State Department)

1. The Government of (State) hereby declare its commitment for the successful implementation of Farmer Managed System (FMS) through Water User Society (WUS) in _____ (give name of PPIN cluster) under the Modernization of Command Area Development works (MCAD) scheme.

    1. The Government of (State) undertakes to support the formation of Water Users' Society (WUS) in the cluster, help it to take over the control and management of the PPIN system created under MCAD scheme under Irrigation Management Transfer Agreement and the WUS in the economic capacity for sustainable independent functioning through means of education, training, handholding support and release of admissible financial grants.
    2. The Government of (State) undertakes that it will allow, will have no interference and will support with all administrative, legal and statutory measures for the WUS to work independently to carry on the management, upgradation, modification of the PPIN system through its own resources after the expiry of the handholding period. of 5 years.

Date:

Signature:
Name:
Designation:

(Also, affix the official seal)

MODERNIZATION OF COMMAND AREA DEVELOPMENT WORKS (MCAD) SCHEME

DETAILED DESIGN REPORT (DDR)

Will be Prepared by approved Consultants to provide complete Technical, Social and Economic Image of the Cluster

This will be read in conjugation with the Proposal Report

Name	
Designation	
STATE	
DEPTT.	
DATE SUBMITTED	

FORMAT OF DDR

The tile page shall contain logos of the State Government and the Project Implementing Agency (PIA) besides highlighting the names of the State Government and concerned Ministry/ Department/ PIA. The unique ID for the cluster issued by the CADWM Wing for the approval of the Proposal Report shall be duly indicated. The DDR shall be prepared so as to highlight summary of information as well as to cover descriptive information to the requisite details. The abbreviations used in the DDR shall be listed upfront for clarity and understanding. The Tables, Photographs, and Plates presented in the DPR shall be meaningfully numbered and their titles listed in Index. Each Annexure shall be presented with clear title and also listed in Index. The DPR shall be presented in the following format:

I	Title Page of DPR
II	Index of DPR
III	Verified Content of the Proposal Report
DESCRIPTIVE CHAPTERS	
Chapter-1	Technical Design of PPIN in the Cluster
Chapter-2	Operation & Maintenance of the System
Chapter-3	Water Accounting in the Cluster
Chapter-4	Social Design in the Cluster
Chapter-5	Economic Design in the Cluster
Chapter-6	Implementation Schedule
Chapter-7	Organizational setup and Project Management
Chapter-8	Cost Estimates and Financial Scheduling
Chapter-9	Convergence with Programs of Other Ministries
	ANNEXURES

1. TECHNICAL DESIGN OF PPIN IN THE CLUSTER

a. Irrigation Planning of Command Area Cluster

This chapter would highlight the intensity of irrigation to be achieved, cropping pattern adopted and the operation plan. This chapter would broadly cover:

- Source of irrigation available in the command area,
- Details of layout of the PPIN network;
- Design/envisaged flows in the system,
- Details of the network and Gross Command Area and Culturable Command Area covered under each system,
- Distributory-wise name of the outlet and their discharge and CCA
- Operational details of the system including rotational programme of various sources with discharges
- Water account of all the distributaries/ minors and its comparison with the design data discussing the designed and achieved intensity of irrigation
- Deficiencies in the supplies, if any
- The system constraints and proposed action for taking remedial measures
- Prevailing On-Farm Water Management practices; need and the strategies to be adopted to bring about a switch over from the present practices to improved and better water management practices
- Suitability of micro irrigation in the command; availability of grid power in the command for reliability of micro irrigation; extent of micro-irrigation and coverage of solar power backup proposed.
- The areas to be covered under micro irrigation in the PPIC command of the project may be identified and marked on the map.
- Potential for reuse of waste water in the command with comment on its techno-socio-economic viabilities
- Potential for full or part development through PPP mode along with details of supporting studies, if any

b. Survey, Planning and Design

Survey and investigation of the entire command area should be done with chak up to 1 Ha and drawings/maps be attached. This chapter should detail the complete methodology to be adopted along with physical and financial progress targets. For the sake of standardization, the assistance of /central PMU can be taken to address the key goals of scheme. The survey should also detail the stakeholder willingness to adopt the PPIC based MI systems. Further, the mechanism for active involvement of farmers/WUS in the Survey, Planning and Design should also be clearly brought out. The chapter would cover details of all relevant maps and typical engineering details/ drawings.

c. System level improvements, Improvement of Waterlogged/saline areas, and clubbing of water resources.

System level improvements activity may be taken up if irrigation project is found to be operating much below its potential because of the deteriorated conditions the canal network, and the conditions can be rectified by measures such as: cleaning of the channels by de-silting and weeding; raising earthwork in embankments or dressing the bed and side-slopes to the design standard and removing undercuts in hard strata; strengthening of banks in filling sections; restoring bed gradients; replacing and painting metal parts in gates and hoists; making control and measuring devices fully functional etc. These water conveyance deficiencies may pertain to any

part of the canal network below the head regulator – i.e. in main canal, branch canal, distributaries, or minors.

Improvement of Water Logged/saline areas activities can include activities like (i) Surface drainage, including reclamation through Bio-drainage; and (ii) Sub-surface drainage. The provision for clubbing of water resources have been kept to give flexibility to States for integrating various sources for providing an established source of water for PPIC command.

The chapter would cover details of all relevant components of works along with pertinent maps and typical engineering details/ drawings. The layouts of the pertinent portions of canal system, Water Logged/saline areas and clubbed water resources shall be presented in suitable digital maps along with geo-tagging of the major intervention points. All the items taken up for execution may be documented in detail covering total assessment of work and line of action for taking up these activities in a systematic manner.

d. Design of Pump House and Irrigation Management Command & control centers at 300 ha/ 1000 ha/5000 ha level

For transporting water from established sources to farm gate, pump-house at the head of the minor canal can be built for the providing pressurized irrigation water at the farm gate ready for micro-irrigation. The current indigenized technologies for inline pumping require only 5 minutes storages to avoid cavitations of the pumps but this requires availability of assured water in the distributary always. The component areas will supports the inline pumping. However, it is up to the State to either suitably tweak the conveyance system or devise a model of their own based on their constraints and requirements. The question of inline pumping vs the Diggi Based or overhead storage is important to understand. For a command up to 5000 ha, the diggi or underground tanks will be too large and poses land acquisition issues. For the small commands upto 300 ha, overhead storage can be created with time and safety related issues.

The Irrigation Management Command & control centers are required to serve as single place for the overall management of PPIC command. A typical 5000 ha cluster project may require 5 pump houses/ Command and control centers at 1000 Ha and 15 Command and control centers at 300 Ha. This provision is for Civil Works and Porta structure needed for construction of Pump House and Irrigation Management Command & control centers at 300 ha/ 1000 ha/5000 ha level.

The chapter would cover details of all relevant components of construction of Pump House and Irrigation Management Command & control centers with pertinent maps and typical engineering details/ drawings. The layout of these structures shall be presented in suitable digital maps along with geo-tagging of structures covered under automation. In addition to presentation of the quantum of different work components in appropriate units, the physical and financial phasing targets may be indicated. All the items taken up for execution may be documented in detail covering total assessment of work and line of action for taking up these activities in a systematic manner.

e. Design of Communication network and cloud-based Automation Command Centers

The Communication network shall largely include the GPRS Communication, SCADA Controls and Software & App based management system. All units are now Made in India and there is no foreign components. The components of the control system can be Village Management System (VMS), Outlet Management System (OMS), Pressure Flow Control Metering Device (PCFMD) and Flow Outlet. The system may be provided with one VMS per 300 Ha, one OMS per 30 ha, one PCFMD per 5 Ha and one Flow Outlet per 1 Ha.

The automation of Command Centers through Communication network will be taken up with a view of improving demand-side management in irrigation. The implementation of demand-side management in irrigation sector has been difficult mainly on account of the complete absence of control and measurement system at water users' end. Therefore, the whole PPIC system need to be upscaled through Internet of things(IoT) based digital twin for real time data collection and processing. Use of Artificial Intelligence and Machine Learning (AI/ML) can be in built to automate the decision making. The monitoring of leakages, pilferages, pressure, flow, soil moisture etc. will bring the efficiency and effectives in water savings and service delivery.

The elements under this intervention may include items like tower, LoRaWAN gateway, end nodes/devices, network server, application server etc. This intervention is expected to enable centralized control by the WUSs. The telemetry through LoRaWAN network architecture can be deployed in a star-of-stars topology as gateways to relay messages between end-devices and a central network server.

The chapter would cover details of all relevant components of Communication network and cloud based Automation Command Centers. The layout of the targeted PPIC cluster shall be presented in suitable digital maps along with geo-tagging of structures covered under these components. In addition to presentation of the quantum of different work components in appropriate units, overall extent of communication and automation are also to be presented in terms of the CCA covered. All the items taken up for execution may be documented in detail covering total assessment of work and line of action for taking up these activities in a systematic manner.

f. **Design of Electro-Mechanical works, Primary filtration system, and Surge Protection system**

The chapter would provide details of the Electro-Mechanical works, Primary filtration system, and Surge Protection system. The Electro-Mechanical works include Pumping Machineries, Electrical substation and accessories. Online Self-Cleaning Primary Filtration System of 300 Micron will be installed at Intake Pumping Station discharge or any suitable pumping station/location to avoid the suspended solids and at each Chak Level (150 microns) before the micro irrigation system below chak level.
The chapter would cover details of all relevant components i.e. quantities, rates, technical specifications, relevant SoR, etc . The layout of the targeted PPIC cluster shall be presented in suitable digital maps along with geo-tagging of structures covered under these components. In addition to presentation of the quantum of different work components in appropriate units, overall extent of Electro-Mechanical works, Primary filtration system, and Surge Protection system are also to be presented in terms of the CCA covered. All the items taken up for execution may be documented in detail covering total assessment of work and line of action for taking up these activities in a systematic manner.

g. **Design of Primary, Secondary and Tertiary Pipeline Network**

The Primary Pipeline Network may be from water source to 300 ha Village Management System (VMS) outlet. The Secondary Pipeline Network may be from 300 ha VMS outlet to 30 ha Outlet Management System (OMS) Chak outlet. The Tertiary Pipeline Distribution may be from 30 Ha OMS outlet to each 1 Ha manual Valve without Farmer MI system. The Village Level Water Management System (VMS) is considered one level above Outlet Management System for Area of average 300 Ha. This will be designed to control the irrigation water within a village boundary. Outlet Management Systems of 30 Ha is created wherever required.

The Primary, Secondary and Tertiary component wise cost cost may vary depending on many factors including the geography, water source, pipeline network design, size of the projects etc.

The States have flexibility to choose among the sub components based on their local realities, subject to the overall component ceiling.

The chapter would cover details of all relevant components of pipeline network along with pertinent maps and typical engineering details/ drawings. The layouts of pipes under each OMS shall be presented in suitable digital maps along with geo-tagging of the outlet. In addition to presentation of the quantum of different work components in appropriate units, the extent of pipeline network works are also to be presented in terms of targeted CCA and the anticipated increase in IPU. All the items taken up for execution may be documented in detail covering total assessment of work and line of action for taking up these activities in a systematic manner.

h. Energy Efficiency

Detail out the energy consumption by the PPIC system, likely Energy savings, Use of energy efficient system Like VFD drives, Building Plans and Blueprints, Equipment and Appliance Inventory, HVAC System Information, Lighting Inventory, Process Descriptions, Maintenance and Service Records to be maintained, Energy Management System (EMS) Data, Metering and Submetering Data, Energy Auditing methods, Energy Efficiency strategy in the future.

2. OPERATION AND MAINTENANCE OF THE SYSTEM

This chapter will deliberate the (i) System Operations (ii) System Maintenance (ii) institutional arrangements, staffing, and capacity development; (iii) buildings, facilities, and equipment; and (iv) financial sustainability (v) O&M Manual

a. System Operation

Operation refers to timely and daily operation of the PPIC system including the pumping, air management, flow and pressure control management systems. The source of water for most PPIC systems will be from a main, branch, or distributary canal. Flow should be available 24/7 in these canals. If rotation of supply to canals is being practiced this will need to adjust to that cycle.

As PPIC systems are downstream control systems (i.e., the flow rate from the canals is controlled by flows at the tertiary level, Chak, Outlets. Devices at these Outlets limit the flow rate to the design set values. Pressures and flows are also controlled at the Hubs. From the Outlet, and within the tertiary irrigation unit (Chak), farmer irrigators convey water to their fields by turns. Farmers can turnoff/ reject the flow supplied to the Outlets but will not be able to take more than their share. The chapter will detail out the likely impacts on the system performance for the gravity-based irrigation from the outlets designed for Micro-Irrigation.

b. SCADA system

To facilitate operations, a SCADA system, which will allow real time remote monitoring of pump operations, and flows and pressures at Hubs and Outlets of the PPIC system. The SCADA system will send alarms in case of tampering, or abnormal operations, and could shut down pumps and/ or close valves in the case of pipe burst and loss of pipeline pressure.

c. System Maintenance

Give details about the maintenance requirements of the system starting with debris removal, removal of trash from screens, de-sedimentation from basins, at the head of each PPIC system, Maintenance of the PPIC systems requires the timely replacement of broken flow and pressure control devices, flow meters, pumps, and regular cleaning of screens and filters.

The maintenance needs of the SCADA system is also important. Routine hardware maintenance includes the replacement of failed sensors, old batteries, and compromised wiring. Even with lightning protection, a site experiencing a direct strike may require complete replacement of equipment.

For pumping equipment, the manufacturers' maintenance instructions for periodic checks and inspections for noise, vibration, leakage, temperatures of bearings and windings, fuel/ power consumption, capacity, and output (water discharge and dynamic head), ventilation, may be detailed.

Pre-season maintenance checks may be detailed out for the pump's impellers for wear, lubricate pump, vacuum gauge, pressure gauge(s) on the discharge pipe(s), power and control panels, wiring and pump enclosure, headgates, Grease gate, pipeline damage and leaks, servicing of valves, including flow and pressure control valves, Corrosion of valves, gland bolts, Leaks from spindle rods

Post-season maintenance checks may be detailed out.

d. O&M Staff, Store, and Capacity Building

O&M is likely to be particularly difficult immediately after construction as the farmer irrigators will need time to adjust and for trust in the system to build up. The contractor therefore should provide for the construction and stocking of an O&M store, for support for O&M following commissioning for 5 years and roll out to hand over the system to WUS.

Indicative O&M Staff may be detailed out. Actual staff numbers and its reporting to WUS O&M subcommittee may be elaborated. This must include SCADA operators, Storekeeper, Pipe system manager, Pump Manager.

The Capacity Development of the WUS which will be ultimately responsible for the O&M of the PPIC systems once they are handed over. The core training of the O&M staff for (i) Distribution of water within the subproject area, (ii) maintenance of infrastructure, facilities, and equipment within the subproject area, (iii) payment of electric energy charge, and (iv) collection of water charges from farmer (landowner) beneficiaries, may be laid out.

An asset management database in printed and digital format , which will have a standard structure for all MCAD subprojects, will be handed over the WUS to facilitate maintenance, and the timely replacement of broken devices such as flow control valves, pumps and so

O&M Maintenance Store inventory with condition of tools, spare fittings such as key rods for operation of sluice valves, hooks for lifting manhole covers, pipe wrenches, spanner set, ring spanner set, screw drivers, pliers, hammers, chisels, caulking tools, crow bars, spades, and dewatering pumps, and so on may be detailed out.

3. WATER ACCOUNTING IN THE CLUSTER

a. Water Metering

The SCADA based system will be linked to the Water Accounting software for the cluster.

At the collective irrigation system level, irrigation water accounting (IWA) relies on the quantification of water fluxes from the diversion point to the plants, at both the conveyance and distribution network and the irrigated field level. Direct metering of irrigation water on the demand side, at each node of the distribution network and on-farm systems may be described.

b. Satellite Based Irrigation Water Use

Daily satellite images are processed to calculate the crop production soil moisture, evapotranspiration (Eto), and water requirement for each farmer's field in the cluster. The satellite-suggested data and water requirement data for individual farms are then assembled to compute water use at the cluster. The protocol to link this with the India Irrigation Management System (IIMS) may be detailed out.

4. SOCIAL DESIGN IN THE CLUSTER

a. Structure of the Water User Society [WUS]

All primary beneficiary farmers/members who own the land which shall be pooled for implementation of the Pressurized Irrigation Networks (PPIC) network. The geographical boundary will be the natural boundary of the WUS. All land owners are mandatory bound to be members. The organization of the WUS up to 5000 ha will have the following structure:

- 5000 ha Cluster
  headed by Pani Pradhan (PP)
- 1000 ha Division
  headed by Deputy Pani Pradhan (DPP)
- 300ha Village / Zone
  headed by Assistant Pani Pradhan (APP)
- 30 Ha Chak Area form a Chak Committee (CC)
  headed by Junior Pani Pradhan (JPP)
- 5 ha Sub Chak Committee (SCC)
  headed by Jal Mitra (JM)

All positions shall be volunteer positions, appointed by the Governing Body of WUS. Efforts can be made at local level to merge the various functions of Atal Bhujal Scheme, Jal Jeevan Mission Scheme, Water Shed Scheme into the Governing apparatus of WUS.

The names and contact details of the various functionaries may be compiled.

b. Empowerment of farmers

Promoting the formation and capacity building of water user Society (WUS) and then enabling them to become sustainable by strengthening capacity of farmers with a view to increase irrigation efficiencies and water productivity at farm level through

- a comprehensive participatory multi-faceted training program,
- deployment of manpower at all levels for successful implementation of all agri activities and in view of successful operation and maintenance of the project, water use efficiency
- development and effective use of farm demonstration sites/ Farmer Field Schools (FFS's) for advisory service and capacity of farmers,
- helping them to develop agri- and other business-related activities, together with establishment of Farmer Services Centers (FSCs) and conductance of, and provision of supporting infrastructure in FSC's including call center, training facilities, service equipment and facilities.

A detailed description on the above aspects may be provided.

b. Women's Development and other specific target groups

Recognizing the role of women in agriculture and the demand and need to support livelihoods for women and the poor, the MCAD program will support the WUS by matching grants. Under these grants necessary support will be extended for training and purchase of necessary equipment. These would be handover to the trainees at subsidized rates. The livelihoods support system for Income generation businesses for women, including processing of agriculture produce, and homestead gardening, Labour saving equipment to reduce workload and drudgery for women for agriculture and in the household. For example: (i) food-processing equipment, grinding mills, huskers, (ii) solar drying and milling equipment, (iii) solar irrigation pumps for home-based crop production, orchards, and aquaculture, (iv) manually operated strippers and shellers (for maize), and (v) manual and motorized threshers, cleaners. All such possible efforts may be reported.

c. Vandalism-theft-damage Management

Theft, vandalism, and tampering is often problematic, and requires the support of the subproject community to address. The root causes are often lack of understanding or dissatisfaction with the system, which stems from lack of consultation during the planning and design process. The various measures that can be taken at local level may be described. The education, reward and punishment may be elaborated.

On the impact of vandalism, the Pipeline Safety Provisions for suitable Surge Protection System pump trip protection, Surge Protection, offline/Bypass of pipeline, Anti Drain features, Remote Management System, Outlet Management System Burst avoidance system, escape and the draining of pipeline may be detailed out.

5 ECONOMIC DESIGN IN THE CLUSTER

a. Water Charges and Financial Sustainability of WUS

For the designed level of service to be maintained, adequate funds are needed to maintain a well-stocked spare parts store for the PPIC system(s), and for timely maintenance, and effective operations. With PPIC systems accurate flow measurement and volumetric charging to individual/ small groups of farmers is possible. Furthermore, in case of non-payment by any one farmer, supply of irrigation can be cut off without affecting supply to others.

The details for each subproject, the annual O&M costs should be estimated during the design of the subproject, and the WUS may be informed about the (i) staffing and administrative costs of the farmer organization, (ii) maintenance costs, and (iii) energy costs.

A detailed water charge system may be detailed out based on the O&M cost, kitty for upgradation of the system and minimal funds required for possible business development incomes.

b. Link of WUS with Agriculture Production and Agribusiness Development

The availability of PACS, existing FPO in the cluster may be identified. The likelihood of linking of the WUS with the existing PACS and WUS may be detailed out.

The eco system for the agri business in the cluster, agri markets, cropping pattern, activities related to food or cash crop production, processing, and distribution, final consumer, credit facilities etc. may be elaborated.

Various stakeholders like farmers, input suppliers, processors, retailers, and consumers, all interconnected entities may be identified to develop business plans and increase profitability for the WUS to evolve as an Economic Entity.

Possibility of the Cooperative ownership of Machinery requirements and facilities for each subproject should identified by local stakeholders and may include: (i) tillage machinery, (ii) harvesters, (iii) threshers, (iv) crop (grain) drying equipment/ facilities, (v) irrigation pumps, (vi) solar power, (vii) sprayers (for pesticides), (viii) grain storage facilities, (ix) threshing floors, (x) seed storage bins, (xi) fruit and vegetable grading, cleaning, storage, and packaging facilities, and drones etc.

In case WUS is motivated to be developed into a FPC, the path way may be indicated.

c. WUS Agri-business Development Training and Support

Training needs to build capacity and foster linkages of agriculture, fishery, dairy and markets may be identified for the cluster.

Training needs of the WUS may be detailed for Good Agriculture Practices (field crops, vegetables, aquaculture) based on soil type & fertility test, weather/water sensitive agricultural production including the development of site-specific precision and climate resilient production recommendations, and mechanized agriculture tools, equipment, machinery,

The chapter would also detail out the infrastructural facilities already available in the cluster and the gaps therein affecting the overall production and economy of the farmers; the covered infrastructure components may include:

- Agricultural supporting services: (a) inputs viz seeds, fertilizers, pesticides etc.; (b) system of agricultural extension; (c) Agricultural Research indicating the list of Agriculture Universities, other research demonstration Institutions and extension education facilities as available
- Roads
- Market centers
- Other miscellaneous services such as plant protection, horticulture, soil and water testing, agro-industries and other small/ marginal farmers' development agencies etc.
- Facility available for agricultural credit from various banks; the mechanism for arranging short- and long-term loans/credit to small/marginal farmers and other fanners may also be detailed.

6. IMPLEMENTATION SCHEDULE

The MCAD works in a cluster are fast track projects with quick results. For the scheduled erection period for the PPIC system of TWO years and additional O&M / Handholding period of FIVE years, a detailed mile stone dates of the implementation schedule of each component of work along with respective bar charts of time scheduling, would also be included in the chapter.

7. ORGANIZATIONAL SETUP AND PROJECT MANAGEMENT

This chapter would describe the current organizational setup of the Project Implementing Agency (PIA) and also cover the proposal of the State Government for setting up the suitable Command Area Development Authority, if not already done. In case implementation of different project components are proposed to be executed through multiple agencies, the details of nodal PIA and each of the supporting PIA may be furnished with details of activities covered by each PIA. The particulars of the nodal officer of PIA (in case of multiple agencies, nodal officers of each PIA) covering name,

designation, address, phone/ fax/ mobile and email would also be included in the chapter. The available staff strength of the PIA(s) may be assessed in light of the anticipated peak work requirements for timely completion of Project, and the gap (if any) may be filled by creation of incremental establishment; physical and financial details of such an incremental establishment would also be presented in the chapter.

The chapter would describe the framework of Project Management for holistic implementation of all targeted activities delineating the roles and responsibilities of different officials under each targeted Projects as well at State level. The issues of coordination between different departments, especially in case of activities involving convergence under different Schemes, may be assessed judiciously and mechanism for their earliest resolution may also be developed and presented in this chapter. The chapter would contain details of the State level Committee or other mechanisms set up by State Government for strengthening the monitoring of the MCAD Scheme. The periodicity of the monitoring exercise, the manner of reporting, and methodology adopted for bringing about a qualitative improvement in the implementation of the program may also be highlighted. The steps related to promotion of the Management Information System, public dissemination of information and transparency may also be described. The road map for performance evaluation of the project components covering details of evaluating agency (if identified), scope, estimated costs, and timings of evaluation etc. would be presented in this chapter. The chapter would also include all evaluation studies done so far, whether for the project as a whole or for Specific component of the project, with details of the findings thereof.

8. COST ESTIMATES AND FINANCIAL SCHEDULING

This chapter would present the assessment of workload under each activity, and the item-wise unit rates and cost estimates of the works. The assumptions made (if any) regarding assessment of the work quantities shall be highlighted along with reference of the applicable schedule of rates. In case, rates are not available under applicable schedule of rates, the pertinent rate-analysis/ justification of the rates may also be furnished. Besides the summary of total cost estimates for the whole project, the detailed cost estimates of each targeted scheme component may be presented; and in case for estimates of some scheme components separate DPRs are being proposed, the fact may be highlighted while furnishing preliminary/ tentative cost estimates.

The chapter would also present the quarterly and yearly financial scheduling for each targeted scheme component of the project and for the overall project. The proposed financial scheduling shall be in tune with the works implementation schedule.

9. CONVERGENCE WITH SCHEMES/PROGRAMS OF OTHER MINISTRIES

Various other Ministries of Government of India such as Ministries of Agriculture & Farmers' Welfare, Cooperatives, Panchayati Raj, Rural Development, New and Renewable Energy, etc. are operating programs/ schemes which have components relating to empowerment of farmers/WUS. The provisions of such schemes have to be used/ dovetailed to benefit the farmers. The chapter would identify convergence with such existing programs/ schemes of other ministries detailing specific components of these schemes and linking them with the activities targeted under MCAD. The chapter would also clearly bring out that there is no overlap in funding of the same activity/ component from two different schemes, and would also highlight the safeguards proposed in this respect.

10. ANNEXURES

The Design calculations, Model Contract Document, Various maps/ layouts/ engineering drawings, DEM, Piping calculations, specification sheets elaborately tabulated data/ spread sheet or any other information repeatedly referred under different chapters may also be placed as Annexure with

appropriate numbering. The titles of Annexure shall clearly reflect the contents of annexure, and footnotes may also be used for improving overall clarity of information.

1. For Irrigation as a Service (IaaS) , the Contractor appointed through EPC mode shall be the Irrigation Service Provider (ISP) in the Cluster.
2. The Irrigation Service Provider (ISP) will ensure service level benchmarks of supplied water through PPIN.
3. The envisaged scope of work of the Service Provider will include the following

    a. *In Basic Planning work, for example*

    - Point out the errors in the GIS/ topographical data about the canal network and command area farmer survey and as per bhunaksha data available.
    - Identification of the cropping pattern and water requirement during Kharif, Rabi seasons based on farmer survey and Computation of command area that can possibly be irrigated during Kharif, Rabi seasons based on survey data collected
    - Undertake detailed assessment of PPIN network and Estimate the potential volume of water to be delivered at every outlet present in the project area. Existing drawings of the canal network and prevalent canal operational and maintenance practices.
    - Give data support to develop the farmer mobile application
    - Achieve Key Performance Indicators (KPis) and Key Monitoring Indicators (KMis) and Report the same in SOPs.
    - Development and submission of Seasonal Operation Plan (SOP) for every season during the Operation Period, Development and submission of Draft Irrigation Schedule
    - Addressing the queries of the WUS, technical auditor as needed

    b. *In Operational Work, for example*

    - Operational Activities - These refer to regular operational activities undertaken in the PPIN network towards delivering water by providing manpower for gate operation, operating outlets, flap gates etc. to ensure equitable supply of water

    c. *In Maintenance Work, for example*

    - Maintaining the Farm level water supply efficiency measures
    - Routine Maintenance Activities in the Cluster prior to the irrigation cycle
        - Conduct inspection of the civil and mechanical structures/installations
        - Structural repair works
        - Clearing of debris and vents
        - Closure of PPIN on breaches, if any
        - Oiling, cleaning & greasing

d. *In Social Work, for example*

- Encouraging and enabling Participatory Irrigation in the Project Area through coordinating and supporting the existing Water user Society.
- Undertake Activities in association with the other implementation partners like FRA, WUS Committees etc. at ground level
- Conduct capacity building and training for the farmers on aspects such as water use efficient (WUE) agriculture and irrigation practices such as SRI for paddy, micro irrigation, crop diversification etc.

4. The Irrigation Service Provider may be allowed to provide any additional services only with the approval of WUS, like: renting of flexible pipes or pumps to WUS, Installing shared MI (drip/sprinklers/centre pivots) systems on field, filling private farm-ponds within project area or developing any other source of revenue for the farmers.

1. The FRA will be an Institution of repute within the state. It may be the social/ economic department of the University, WALMI or a specialised autonomous institution. It will report to the State PMU.
2. The FRA will employ "Paani Krishi Mitra" (PKM). The PKM will be individuals engaged at the cluster level who will
    a. facilitate Identifying and mapping of all individual farmer activities in the 50 to 500 ha. area of the given cluster in the command area
    b. facilitate members to form or join a Water User Society (WUS) and registering the same as a Society Registration Act/ State Co-operative Society. This may also be done by enlarging, merging, amalgamation of existing Water Users Associations (WUAs) , Farmer Clubs , Farmer Interest Groups etc.
3. The FRA will engage with training agencies to conduct Farmer Education programme on Micro Irrigation, water efficient technologies and Irrigation Management Transfer (IMT) to WUS. During conduct of the above programme, FRA will undertake a needs assessment of the type of training programmes required for diversified farming target groups.
4. The FRA will prepare a monthly calendar of Capacity building (Training Awareness/ Demonstration & Orientation Skills) programmes for each cluster and link them with various resource agencies, which can provide that. Capacity building programmes will be required for efficient governance of WUS and to function as viable economic entities.
5. The FRA will facilitate adoption of micro-irrigation (drip/ sprinkler) and installation of IoT devices in all the demarcated farms of the cluster and introduce volumetric measurement regarding use of water to bring in Water Use Efficiency (WUE)
6. The FRA in association with WUS, will undertake crop planning based on crop water requirement, suitability for crop diversification and scheduling of crop cultivation activities as per production timelines on a given dashboard. The crop planning to be premised on the cluster on following factors:
    - serving as food supply to Army in border areas, wherever required,
    - creating a food basket cluster for nearby/ remote villages with requirements to be assessed based on nutrient requirements in the population
    - suitability of One Cluster One produce, which has high value in the market,
    - promoting organic Farming of few agriculture commodities which have high value

- combination of the above factors in large area clusters

7. The FRA will support for planning for a sustainable business model of registered WUS
    - Assess the requirements of Agri robots and drones and connect with the State team and other resource agencies to identify suitable trainers and experts
    - Supporting WUS for preparation of the DPRs for Bank finance and Government of India scheme interest subvention/ subsidy support for acquiring the food processing units
    - Interacting with suppliers for erection and commissioning of processing units, storage infrastructure

About Irrigation Areas:

Net Irrigated area (NIA): It is the area in ha which is irrigated by any source of water in a year for a particular crop.

Gross Irrigated Area (GIA): The area irrigated under various crops during a year, counting the area irrigated under more than one crop during the same year as many times as the number of crops grown and irrigated. GIA= Cropping Intensity X NIA

Irrigation Potential (IP) : The total gross irrigated area proposed to be irrigated under different crops during a year by a irrigation scheme.

Irrigation Potential Created (IPC): The area proposed to be irrigated in one year under more than one crop and counted as many times as the number of crops grown and irrigated. As per Planning Commission (Niti Ayog), this area under IPC is counted only when the irrigation works and CADWM works are completed up to the farm gate.

Irrigation Potential Utilized (IPU): The gross area actually irrigated during reference year out of the IPC during the year.

Intensity of Irrigation (Seasonal/Annual): The percentage of Culturable Command Area (CCA) that is actually irrigated during a specific season is the seasonal intensity. The annual intensity is the sum of the intensities of all seasons during the year, representing the total percentage of CCA irrigated annually. CCA refers to Culturable Command Area, which is the total area that can be successfully irrigated by a given irrigation scheme. IPC, on the other hand, represents the maximum area that can be irrigated by optimal water management. In simpler terms, it's a measure of how effectively an irrigation system is being used to bring land under cultivation. For example, if 70% of the CCA is irrigated during the Kharif season and 40% during the Rabi season, the annual Irrigation intensity would be 110% (70% + 40%)

About Irrigation Systems:

Best Management Practice (BMP) : An irrigation practice that is both economical and practical that will assist in reducing water use, protect water quality, while maintaining or improving crop production.

Sprinkler Irrigation System: Sprinkler Irrigation is a method of applying irrigation water which is similar to rainfall. Water is distributed through a system of pipes usually by pumping. It is then sprayed into the air of entire soil surface through spray heads so that it breaks up into small water drops which fall to the ground.

Drip irrigation system: Drip irrigation system delivers water to the crop using a network of mainlines, sub-mains and lateral lines with emission points spaced along their lengths. Each dripper/emitter, orifice supplies a measured, precisely controlled uniform application of water, nutrients, and other required growth substances directly into the root zone of the plant.

Centre Pivot System: An automated irrigation system composed of sprinkler lateral rotating around a pivot point and supported by a number of self-propelled towers. Water and power is supplied at the pivot point. They are easily identified from the air as large circular fields. The use of drop tubes on a centre pivot or lateral-move systems to apply water at low pressures very near or directly onto the soil surface is LEPA (Low-Energy Precision Application). This increases efficiency and uniformity. Furrow dikes are typically required to avoid runoff. The other modes of centre pivot systems are LESA (low elevation spray application) and MESA (mid elevation spray application).

Agricultural Drainage It is removal of excess water known as free or gravitational water from the surface or below the surface of farm land to create favourable condition for proper growth and development of the plot.

Evaporation: Loss of water as vapor from the soil surface or wet leaves. This differs from transpiration in that the water does not pass through the plant leaves.

Evapotranspiration (ET) : Combined water lost from both transpiration from plant leaves and evaporation from soil and wet leaves. Also known as crop water use, or consumptive use. The crop ET (ETc) can be estimated by calculating the reference ET for a particular reference crop (ETo for clipped grass, and ETr for alfalfa) from weather data and multiplying this by a crop coefficient. The crop ET is the consumptive use (CU) of water from irrigation.

Irrigation Requirement (IR): refers to the quantity of water, exclusive of precipitation, required for crop production. This amounts to net irrigation requirement plus other economically avoidable losses. It is usually expressed in depth for given time. Net Irrigation Requirement (NIR) = Consumptive Use (Cu) - Effective Rainfall (Re)+ water needed for leaching or nursery water. Field Irrigation Requirements (FIR) consider NIR plus losses like surface runoff and deep percolation. For Gross Irrigation Requirements (GIR) add conveyance losses to FIR

Irrigation Efficiency: Proportion of the water that is beneficially used to manage the Consumptive Use to the irrigation water supplied.

On Farm Water Use Efficiency

$W_F = W_{F1} * W_{F2}$

W_{F1} Field Channel application efficiency, which account for the intermittent supply losses in the water courses/ field channels. *Depend on the infrastructure from canal to the farm gate*

Unlined field Channels	40%
Lined field Channels	90%
Pipe	95%

W_{F2} On Farm Field Water application efficiency, which account for the actual water not consumed by the crops. *Depend on use of Precise Irrigation and Farmer Intelligence*

Surface irrigation (border, furrow, basin)	60%
Sprinkler irrigation	75%
Drip irrigation	95%

Considering 30% Drip and 70% Sprinkler use,

W_{F2} = 30% x 95% + 70% x 75% = 80%

Conventional On Farm Water Use Efficiency (considering lined channel with surface irrigation)

$W_F = W_{F1} \text{ X } W_{F2}$ = 90% x 60% = 54%

For MCAD On Farm Water Use Efficiency will be

$W_F = W_{F1} \text{ X } W_{F2}$ = 95% x 80% = 75%

Project Water Use Efficiency:

[Considering Canals are in good shape Conveyance Efficiency = 70%,]

Impact of MCAD on Project Efficiency = 70% x 75% = 52.5%

Without *MCAD* Conventional Project Efficiency = 70% x 54% = 37.8%

Gain in efficiency by adopting MCAD over conventional project = 15%

This will bring a minimum of 15% Possible Savings in Water from the project on adaptation of MCAD.

MCAD SoP B14	Calculation of Electricity Charges for 5000 Ha Cluster	Ver 6.25

Assumptions:

1. Number of Farmers in the 5000-ha cluster= 5000

2. Rate of Electricity supplied to farmers = Rs. 4.50 kWh at average rates

3. The MCAD system operates 24 hrs in a day and 30 days in a Month

Total power requirement MCAD pumphouse for an area of 5000 Ha is 1250 HP (920 kW)

Total Energy requirement (per day) 920 x 24 kWh = 22,080 kWh

Total Energy requirement (Monthly), 22080 x 30 kWh = 6,62,400 kWh

Considering, rate of electric supply Rs. 4.50 / kWh

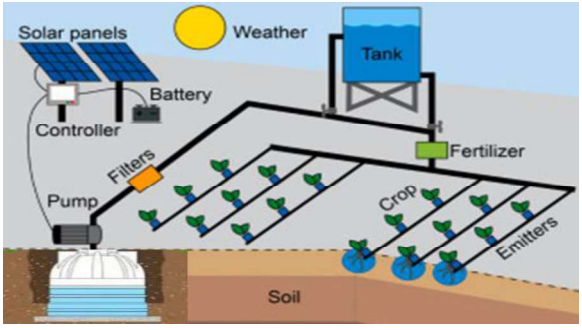
Total Monthly Electricity charge Rs 4.50 x 662400 = Rs. 29,80,800

Electricity Charge per farmer for 5000 farmers = Rs. 596 per farmer per month

MCAD SoP F1	Farm Level Water Management for PPIN	Ver 6.25

1. To bring Water use Efficiency at Individual Water User Level under 1 ha under PPIN : The farmer can utilise the pressurised water directly to the farm for micro-irrigation for drip, mini sprinkler system or use it for the community based centre pivot system. The quantum of water will be quantified at each outlet and each outlet will be controlled through SCADA. In case the farmer is habituated to gravity irrigation, he can use pipe for taking water from the PPIN outlet. This will also give a good on farm water use efficiency.

2. To bring Water Use Efficiency for the or habituated farmers aligned to gravity irrigation or GW based irrigation: an alternative time gap solution can be availed by the farmer at its own cost, for secondary storage in the form of an units of underground 20,000 lts poly tank for one irrigation. This tank will receive the outlet quota **metered water** as per the duty assigned. The duty shall be based on the actual use of water by the crop. This will augment the water storage without wasting land for the Farm pond. Solar pumps and other units can be installed as per the need of the farmer. The system will alleviate the need for GW pumps. Farmer can use water at its own ease.



MEMORANDUM OF SOCIETY
OF
XXXX **WATER USER SOCIETY [WUS]**

State Society Registration Number XXXXXXX (UNDER THE SOCIETIES REGISTRATION ACT, 1860/ Co-operative Society Act)
State CADA Department Registration Number XXXXXXXX
Ministry of Jal Shakti CADWM Registration Number XXXXX

Model Bye Law of Water Users Society [WUS]

CHAPTER ONE: GENERAL PROVISIONS

Article 1.1 : Aim: The Society assisted and encouraged by the XXXXX State Government and by the CADWM Wing of Ministry of Jal Shakti, Govt. of India for the equitable distribution of water, sustainable management of irrigation system by self sustaining means.

Article 1.2 :**Name**: …….Water users Society

Article 1.3 :**Address**: House No……..Road No….., District,……

Article 1.4 :Service area of the Society: The area of operation of Water users Society includes …….
…….. and as per the map attached

Article 1.5: Goal : The Goal of the Water Users Society is the general economic welfare of the Members. The Society shall be entitled to acquire use rights, free of charge, over the irrigation facilities, as well as the service equipment on the territory of the Society as per the terms and conditions for transfer. The Society shall bear the responsibility for the protection and maintenance of these facilities and shall be obliged to have insurance on them.

Article 1.6 Objectives of the Society shall be:

1. To facilitate economic use of water
2. For arranging fair distribution of water to all water users
3. Maintenance of irrigation and drainage infrastructure on the Service Area of the Society.
4. Economic Development of the members of the Society

Article 1.7 Working principles of WUS

1. Democratic Decision making involving Women, aged, other ethnic groups, youth, handicapped, Internally displaced, SC/ST etc,
2. Operations of WUS are transparent to internal and external stake holders
3. There is zero corruption in WUS
4. WUS works in a professional ways efficiently to support it's stake holders
5. WUS will be self reliant and self sufficient in its resources and skills
6. Only one Society shall be established on the territory served by an irrigation/drainage system or by hydrologically detached parts of it.

Article1.8 Responsibilities, Functions and Activities of the Society

1. The operation, maintenance and reconstruction of the irrigation and drainage infrastructure transferred to them pursuant to the Transitional and Concluding Provisions of the Handing over Agreement.
2. Manage delivery of water and prevent contamination of water
3. To take actions to improve land properties for economic use of water
4. Distribute water on contract basis to all members of Water users Society (WUS) and to non-members as per agreement in the service area of WUS. Resolve water related disputes among community and among individual members
5. To build new or rehabilitate the Irrigation systems within the WUS's service area, from its own resources. The construction of new irrigation and drainage systems and the relevant facilities; irrigation water delivery and distribution; the drainage of agricultural lands;
6. To Train members of WUS to use advanced irrigation methods and ensure the using of new methods and technologies to conserve and use water economically and effectively
7. To Purchase irrigation water from private or other sources or divert water from natural water facilities and distribute to the members of the WUS
8. To install modern water measurement equipment, tools or arrangements in the water conveyance structures to quantify flowing or stagnant water
9. To fix and collect user charges or water tax from members and pay the water rates to the Water resources department as per the separate agreement.
10. Converging all agricultural and water related activities under various schemes of the Government of India and that of State Government.
11. To enter into deals and perform activities to benefit the members in getting better economic life
12. Ensure rational and economical water use, reduce non-productive water losses, control soil erosion and salinity, prevent soil/land water logging
13. Ensure full involvement of all members of WUS in establishing water users groups and involve all the groups in managing the affairs of the WUS
14. Ensure just and equitable water distribution among all members of WUS without discrimination
15. Ensure free access to all WUS related information all it's members
16. To ensure ecological safety standards are followed, enforce the water rights and safeguard the legal interest of occupiers and users of water

Article1.9 Definitions and Explanations

1. "Irrigation and drainage infrastructure" represents a complex of structures, technical facilities and equipment for irrigation and drainage, of agricultural lands on the territory of the Society together with service buildings and roads;
2. "Territory of the WUS" is the area of the agricultural lands which is served by one irrigation and irrigation - drainage system or hydrologically detached parts of it with boundaries determined by the State Government.
3. "Irrigation system" is a complex of structures, technical facilities and equipment for obtaining, storage, supply and distribution of water for the irrigation of agricultural crop in order to maintain suitable moisture - air regime;
4. "Drainage system" is a complex of structures, technical facilities and equipment for the collection and removal of excess water from waterlogged agricultural lands aimed at improving the soil water - air regime;
5. "Agricultural practices" are technologies for soil cultivation aimed at improving the soil moisture characteristics, speeding up the removal of excess water, restriction of erosion hazards, improving the temperature regime and biological activity of the soil;
6. "Hydrologically detached part of an irrigation system" is such that receives water from a water source, water intake structure or point of the irrigation system and can be managed independently;
7. "Hydrologically detached part of a drainage system" is such that collects and removes the excess water from the agricultural lands and conveys it to a water course or a canal/pipeline and can be managed independently;

8. "User of agricultural land" is a natural or legal person who uses agricultural land on a legal basis - through a rent contract, leasing, or another legal form of use.

CHAPTER TWO: MEMBERSHIP

Article 2.1 Membership

1. All the farmers occupying land in the Service Area earmarked for the Society can only be members of the Society. Occupiers shall include owners or tenants (the written or verbal lease agreement for tenants shall be verified by the Society). Farmers outside the service area shall be called Outsiders.
2. All members with no default of the dues to the WUS on the day of the Voting shall be the Voting Members.

Article 2.2. Right of Members of WUS

1. One Vote right regardless of the size of the land to elect his/her representative for Executive Committee
2. Suggest agenda for the general assembly
3. A member of Water users group has a just and equitable share of irrigation water distributed by the WUS
4. He/she has the right to use all the services provided by the WUS without discrimination
5. Right to examine the accounts and seek any information of the WUS any time at nominal rates of inspection set by the General Assembly.
6. He/she has the right to claim compensation from the WUS for the damages inflicted on his/her crops damaged due to the actions of WUS taken up to accomplish its goal and objective

Article 2.3 Obligations of Members

1. To make timely payment of the WUS fees and the user charges or water tax
2. Comply with the provisions of the Bye Laws of WUS and by the decisions of the WUS's General Assembly
3. To stick to the irrigation schedule provided by the WUS and receive water as per the specification of agreement with the WUS
4. Ensure careful treatment of the equipment's used or owned by the WUS
5. Allow WUS Committee/ Sub Committee members or WUS employees an access to their facilities to carry out the activities related to the objectives of the WUS
6. To provide correct land and water user information to the WUS when asked
7. To stick to all irrigation systems operation rules passed by the WUS's representative general Body
8. Pay for the Cost of repair or replacement parts of WUS equipment damaged due to age or accident or natural disasters
9. To pay contribution in kind in terms of share in harvest and labour for channel maintenance as specified by General Assembly of WUS
10. To allow WUS to use pipes, cemented channels or any other in both owned or hired land for save water and sustained performance of irrigation system

Article 2.4 Eligibility of membership

All Indian Aadhar Card Holder occupiers in the service area of the WUS, living and having own land or rented land with right to use the land with legal rent agreement, shall mandatorily be the member of the WUS and shall mandatorily agrees to abide by the byelaws of the WUS.

Article 2. 5 Procedure for membership

1. A person meeting the eligibility requirement on his own volition shall submit an application for membership

2. The Executive Committee shall examines his/her request and grants approval or denies
3. An eligible person not submitting an application for membership on his own volition, can be subjected to the membership process by the Executive Committee or may be declared as defaulter on persistent default.

Article 2.6 Membership fee

1. All the members of the WUS will pay a fixed annual fee to the WUS before 15th of March
2. The Annual fee will be fixed by the General Assembly
3. Member who did not pay the membership fee before this date will incur fine imposed by the Executive Committee of the WUS

Article 2.7 Termination of Membership

1. Automatic Ceases to be a member of the water users Society if he/she sells all his land or the lease period of land in the service area of WUS is over.
2. Membership is terminated by the WUS on the following conditions
    - Regular Non-compliance with the WUS Bye Law / order or instruction issued by the General body of the WUS
    - Refusal to pay fees to the WUS
    - Refusal to pay fine or pay for inflicted damages on WUS's irrigation systems and equipment
    - Unauthorized water withdrawal
    - Repeated violation of water distribution schedules
    - Engaged in activities against the interest of the Society

3. Voluntary exit is free **and** Member should apply to the Executive Committee of the WUS in writing three months in advance of the financial year closure (Before 15th December)
4. After termination or exit the member shall attain the status of Non-Member.

Article 2.8 Non-Members

1. Non-Members shall have no Voting rights
2. Non-Members shall not or shall be supplied Water at rate decided by the General Body.
3. Non-members shall be obligated to follow certain conditions as stipulated by General Body.

CHAPTER THREE: STRUCTURE of WUS

Article 3.1: Structure and Functioning of the WUS

1. There will be a General Assembly of all the Members
2. The Executive Committee of WUS shall comprise of maximum of 35 members matching with the Organization structure of volunteers as stated at Article 3.8
    a. Office Bearers: President or Pani Pradhan (PP) (1), General Secretary (1), Treasurer (1)
    b. Vice Presidents or Deputy Pani Pradhans (DPP)
    c. Joint Secretary or Gram Pani Pradhans (GPP)
    d. Joint Secretary (Women) Representative women (Max 5 Nos.)
    e. Executive Committee Members : Chak Pani Pradhan (CPP) or from WUA under JJM, watershed, Atal Bhujal, Forest Schemes,
    f. Special Invitee (Non-Members): Representative of Non-Members (Max 1 No.)
3. All letters shall be signed by President and General Secretary
4. To assist the Executive Committee there will be sub committees.

Article 3.2: General Assembly

1. Defines major activities of the WUS to be undertaken by its Office Bearers
2. Approves the major decisions taken by the Office Bearers
3. Approves, makes or bring amendments to the Bye Law of the WUS
4. Sets the Audit procedures and approves the financial procedures
5. Sets the Annual membership fee and the fee to be paid by non-members
6. Sets the fine payable by the member of WUS who violate its byelaw
7. Approves Annual Reports and Balance Sheets
8. Approves the annual budget, the work plan and the irrigation schedule
9. Elect or Dismiss the members of the Executive Committee or subcommittee members by direct and impartial simple majority voting
10. Makes decisions on re-organisation and Liquidation of WUS
11. Elects Sub committees

Article 3.3: Executive Committee

1. Executive Committee Overall control and supervision of all the channels linked to the main water source
2. Fix and collect the water tax or the user charges
3. Appoint staff and supervise
4. Conduct members meeting and take decisions of water distribution and channel upkeep
5. Divest or take away the water rights if the water tax is not paid
6. Conduct of training and education programs on water management and water conservation
7. Control the performance of the WUS's Executive Committee members or paid employees
8. Convene WUS General body meeting
9. Prepare the agenda for the WUS's General Body meeting
10. Follow the WUS Operational Procedures as specified by the WUS Bye Law in all the activities of the Society

Article 3.4: Sub Committees

1. The General Assembly will elect sub committees of maximum 10 members for a fixed period of 3 years for various purposes including:
    a. Finance Sub Committee headed by Treasurer
    b. Water Management Sub Committee headed by General Secretary
    c. O&M Sub Committee headed by Joint Secretary
    d. Economic Subcommittee headed by a Joint Secretary
    e. Dispute Resolution Sub Committee headed by President

2. No member of the subcommittee shall be member of more than one subcommittee at any time.
3. There will be no limit to re-election of the member to the other subcommittee.

Article 3.5 Water Management Sub Committee

1. Supervision and control of outlets
2. Devise a water distribution plan and get the approval of the general body
3. Implement the water distribution plan
4. Resolve local conflicts in water distribution
5. Decide on limiting supply of water during water shortage periods
6. Penalise the illegal water tapping, thefts and wastage
7. Any other task assigned by the general Body

Article 3.6 Finance Sub Committee

1. Collect taxes or user charges and penalties
2. Identify Defaulters
3. Open account in the name of the Society in a Bank and operate
4. Deposit the money collected in the bank or keep it in safe custody
5. With draw money with the permission of the Executive Committee
6. Spend the money according to the orders of the Executive Committee
7. Maintain all financial record of the Society
8. Prepare annual balance sheet and submit for approval by WUS's General Assembly
9. Any other task assigned by the General Assembly

Article 3.7 O&M Sub Committee

1. System maintenance and upkeep of irrigation structures within the Service Area
2. Supervision of community contribution in term of labour for upkeep
3. Any other task assigned by the General Body

Article 3.8 Dispute Resolution Sub Committee

1. Resolution of the dispute between members of WUS with the WUS within 60 days through mediations, conciliation and arbitration.
2. Any other task assigned by the General Body

Article 3.9 Organization Structure of the Water User Society

The organization of the WUS up to 5000 ha will have the following structure:

At maximum size: 5000 ha Cluster: headed by Pani Pradhan (PP)

At 1000 ha Division: headed by Deputy Pani Pradhan (DPP)

At 300ha (Village / Zone) : headed by Gram Pani Pradhan (GPP)

At 30 Ha Chak for Chak Committee (CC) : headed by Chak Pani Pradhan (CPP)

At 5 ha Sub Chak Committee (SCC) : headed by Jal Mitra (JM)

All positions shall be volunteer elected positions, appointed by the Governing Body of WUS. Efforts can be made at local level to merge the various functions of Atal Bhujal Scheme, Jal Jeevan Mission Scheme, Water Shed Scheme into the Governing apparatus of WUS.

CHAPTER FOUR: PROCEDURES

Article 4.1 Time of the general body meeting

The general body meeting would be held at least once every year and would be conducted preferably during the month of March/April.

Article 4.2 Quorum

1. For General Assemblythe minimum number of members to be present for the general body for WUS meeting to begin its proceedings is 66 % or 2/3 of the total voting members. 30 minutes grace time can be given to start the proceeding. If the minimum attendance is not there even after the grace time the general body meeting is cancelled or postponed to a later date.
2. Quorum for the Executive Committeeof WUS meeting is 66% or 2/3

Article 4.3 Decision making rule at the General Assembly meeting

1. For decisions on amendment of constitution 2/3 votes of the members present in the general body meeting necessary
2. For decisions of merger, division and liquidation of the WUS 2/3 votes of the members present in the general body meeting necessary
3. For all other decisions a simple majority of more than 50 % votes of the members present in the meeting is sufficient

Article4.4 Notice period

1. General Assembly meeting: 30 days
2. Special general body meeting : 21 days
3. Executive Committee Meeting: 7 days
4. All intimation containing the details of agenda, the place, date and time shall be digital through SMS/ Whatsapp, web site or any other digital mode

Article 4.5 Elections

1. Election officer**:** The founding members **w**ill decide the election officer for the first election for each water users group. For subsequent elections the Executive Committee of WUS will appoint a non partial election officer to conduct the election. Election officer is responsible for verifying the eligible voters list and publication of the list. He/she would issue election notice and would conduct the elections to elect the representative from each of the water users group.

2. The elected representatives of all the water users group will conduct the first General body meeting and elect a person to conduct the election for WUS. The elected or selected person will conduct the election to the Executive Committee of the WUS. The subsequent elections would be arranged by the outgoing President of the WUS.

3. The mode of elections of WUS will invariably be by physical voting. A record of which shall be maintained for Annual Audit Purposes.

Article4.6 Terms of office of the Executive Committee Member and Number of Turns

1. The General Assembly will elect Executive Committee Members for three years by direct impartial voting
2. Executive Committee Members of the WUS can hold office to the maximum of 3 terms in life each separated by a cooling period of 4 years.

Article 4.7 Eligibility for Executive Committee Position

1. Indian Aadhar Card holder
2. X class Pass out
3. Aged above 20
4. No default in membership
5. Paid all dues to the WUS
6. Not convicted by Court
7. No family member has held the position of Executive Member in last 3 years
8. Not engaged directly or indirectly as the contractor or consultant of WUS for 2 years since the selecting year
9. Not held any executive position in any other society of similar nature for past 2 years

Article4.8 Disqualification and Expulsion of Executive Member

Any Executive Committee member can be expelled by the General Assembly f he/she indulges in any one of the following behaviours

1. Occupy or misuse the WUS property for personal use
2. Work against the constitution

3. Provide guarantee to any other using the assets of the WUSwith out the permission of the general body
4. Accept commission in trade transactions or indulge in corrupt practices
5. Undertake any activity that would affect the economic benefit of the WUS
6. Hold a position in management in a WUS of similar nature

CHAPTER FIVE : STAFF & PAID EMPLOYEE

Article 5.1 Staff and Paid employees of WUS

1. WUS may employ staff to keep the accounts, O&M, security, record keeping etc.
2. Prepare a draft budget, operation and maintenance plan for irrigation systems as well as other required documents to be submitted to the General Assembly.
3. Maintain the record of the sub committees
4. Manage WUS's bank accounts in accordance with regulation
5. Prepare contracts for various works
6. Any other issues as defined by the General Assembly

CHAPTER SIX: FINANCIAL ARRANGEMENTS

Article 6.1 Sources of Income

1. Fees paid by WUS members
2. Proceeds from payments by non members
3. Interest paid on bank account funds
4. Donations
5. Grants from governmental sources
6. Other legal sources

Article 6.2 Accounting System

1. The accounting and auditing of the Society shall be maintained as per the laws.
2. The Society shall not allocate profit proceeds among its members and shall use the same only to make investments or for credit repayment.
3. The Society may have one or more bank accounts as decided by the Executive Committee and operated as decided by Executive Committee.

CHAPTER SEVEN : OTHER ISSUES

Article 7.1 Merger or Division

1. Merger or Division or combination with another WUS or organization would be taken by the general body with 2/3 majority decision
2. All the creditors of the co-operative would be informed about the merger decision with in ten days of the decision taken
3. Creditors' claim would be inherited to the combined or divided organisation

Article7.2 Dissolution or liquidation

The WUS could be closed down due to the following reasons:

1. As per the reason stipulated in the Memorandum of Association

2. General body has decided and recommended the dissolution with 2/3 majority
3. Need to dissolve the WUS has arisen due to merger or division
4. Withdrawal of registration by the government or refusal to renew it

Article7.3 Liquidation procedures

1. With in 15 days of the liquidation decision is taken at the general body a liquidation committee with a chairperson should be formed by the WUS
2. Once the liquidating committee is formed it would take charge for disposing off the properties to settle claims except for the properties obtained by state finance or by utilizing subsidy given by the government
3. The liquation committee would handle the law suits and litigations
4. If the WUS incurred loss due to gross negligence of a member of the WUS then the liquidation committee should fix responsibilities and recover the amount from the person(s) concerne

Article 7.4 Amendment of Bye Law

1. Any proposed amendments to the Bye Laws of the WUS shall be first got approved from CADWM Wing, Ministry of Jal Shakti
2. After getting the above approval, the proposed Bye Laws of the WUS can be amended by the representative General body by 2/3 majority vote
3. Amendment to By Law if done should be intimated to the registering authorities within one month of such occurrence

Article 7.5 Obligation to Provide Information and Annual Audit

1. The Society shall keep up to date information on the
    a. the farm lands on the territory of the Society, their owners and users;
    b. the irrigation and drainage infrastructure on the Society territory (location, type, main parameters and physical conditions).
    c. Territory map, data on the owners and users, data on the documents verifying the right of ownership or use, as well as data on the changes in the above facts shall be listed;
    d. a book of protocols recording sessions held by each of the collective management bodies of the Society;
    e. an inventory and a map of the irrigation and drainage infrastructure on the territory of the Society with data on the location, type, main parameters and physical conditions;
    f. a record book for the technical activities implemented in relation to the operation and maintenance of the irrigation and drainage infrastructure.
2. The Society shall be subject to Annual Audit of all its activities to the State CADA Department and CADWM Wing of the Ministry of Jal Shakti and shall publish a Annual Report on its web site. As the WUS has been created with the support of Central and State Government, this condition of providing Information and Annual Audit shall be non negotiable by any resolution of the General Assembly.
3. The society shall provide all information on any WUS members to any member of the society on request for a request amount as decided by the General Assembly.

Article 7.6 Mediation and Arbitration

1. Any dispute arising in between the members of WUS shall be resolved first through a sole Mediator or Arbitrator appointed by the State Government, before resorting to legal remedy.
2. Any dispute arising between WUS and the State Government shall be resolved through a sole Mediator or Arbitrator appointed by CADWM Wing of Ministry of Jal Shakti, Central Government, before resorting to legal remedy.