WELCOME

Presentation By

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Integrated Smart Water Management Solution for Community based Irrigation instead of Traditional Canal Network System

पारंपारिक कालवा नेटवर्क प्रणालीऐवजी समुदाय आधारित सिंचनासाठी एकात्मिक स्मार्ट जल व्यवस्थापन उपाय

SELF INTRODUCTION

Mr. Amol Atmaram Shinde

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Irrigation, Water & Automation Project Professional,
Smart Integrated Solution Provider for Water, Irrigation and Smart Automation Project's.

- **Qualification: M.Tech. (SWCE) and PGD (Piping Design)**
- **Experience: 12 Year's**
- **Worked on many pioneered irrigation projects in India which are largest in the Country, Asia and World**
- **Worked on more than 10 Lakhs Ha of Project in various States of India like Karnataka, Madhya Pradesh, Maharashtra, Odisha.**

- Having Practical Knowledge with Experience of 12 Years in the Field of Water Management & Irrigation / Pipe Project's with Business Development Support, Tendering, Planning, Hydraulic Design, Below chak Pipe Network Planning, Irrigation Planning/Scheduling, Execution of project, Testing, Commissioning, Operation, Maintenance, WUA Formation, Capacity Building with Market Linkages Activities, Micro Irrigation System Network (Drip/ Sprinkler), Valves, SCADA, Automation System, Automation Network Planning, Filtration System, Smart Application Development, Pumping Machinery & Electrical work required for project and Liasoning of Project.

Indian Agriculture Scenario

Land : India has overall geographic area of 328.73 Mha of which about 140.86 Mha is sown area. 2nd largest arable land bank in the world.

Water **:** Despite having the highest irrigation acreage globally, about 70m ha of agri-land in India is rain-fed . 62 Mha is net irrigated area.

Climate **:** Diverse climatic conditions. 12 hours average sunshine per day. Average Rainfall 1000 mm. However erratic and unevenly distributed.

Population **:** More than 1028 Million (growing at a rate of 2% per annum). 53% of the population is directly dependent on agriculture with another 27% indirectly dependent on the sector.

Land Holding: At less than 1.5ha, India's average land holding size is one-hundredth that in the USA. Marginal holdings (< 1ha) make up 63% of total land holdings.

Productivity: Agricultural productivity in India are still one-third to half that of world best levels in many crops.

GDP **:** Indian Agriculture accounts for 16.4% (2007-08) of the nation's GDP (Gross Domestic produce) and 14% of Exports. Share of agriculture in overall GDP came down from 57% in FY51 to 16.4%.

Against above, the government is now targeting 4% growth over the next two decades.

Source: Ministry of Agriculture and Cooperation, GoI

Scenario – Water for Food

- Food production has to increase from 247 to 494 m MT (AD 2050) to feed the ever increasing Population.
- Increase in cultivated area will not add much to this requirement. (Possible increase only 2 m ha from the present 141 m ha).
- Converting rain-fed crops to irrigation cover (Partial or Full) is the only way out (irrigation cover to increase from 62 to 146 m ha).

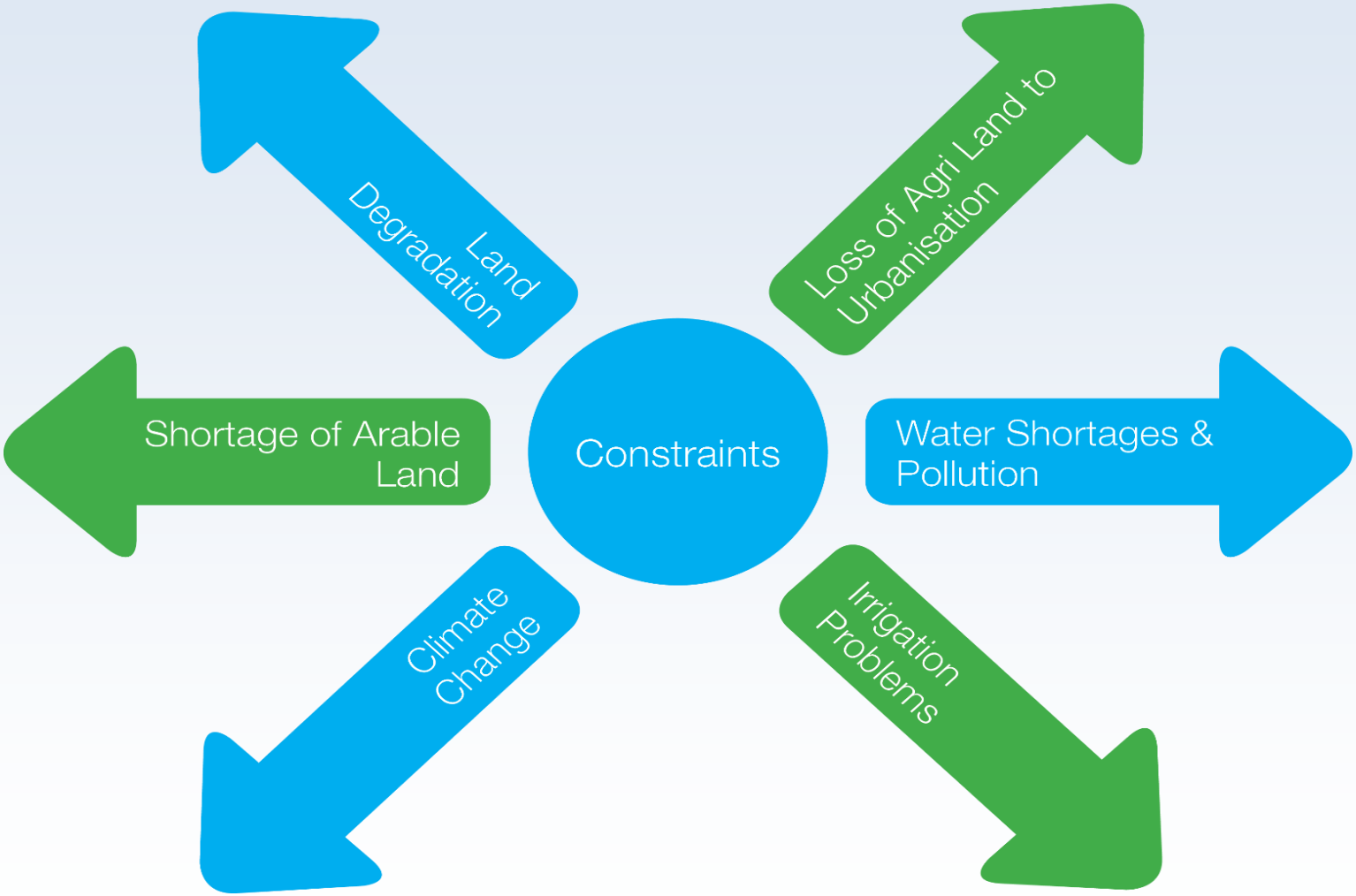
- Gross Water Requirement increases to 1200 BCM from the present 700 BCM.
- Available water remain at 1137 BCM
- Water deficit will force us to take ***extreme measures*** by 2030-2050.
- Before that happens conservation of water would help us survive better.
- Irrigation is the largest water user (+ 83%)
- Reducing water use in irrigation by increasing use efficiency will generate more water for irrigating more land area.

Source : ICID

Limitations of Existing Agriculture

- Marginal Land Holdings
- Widening productivity disparities between irrigated and rain-fed areas
- Uneven and slow acceptance of technology
- Lack of adequate incentives and appropriate institutions
- Degradation of natural resource base, e.g. Water Pollution, Soil Degradation etc
- Rapid and widespread decline in ground water table.
- Increased non-agricultural demand for land and water
- Inadequate mechanization and labour shortage
- Inefficient use of inputs e.g. fertilizers, irrigation and pesticides
- Wastage of agricultural produce due to inadequate Post Harvest operations.
- Lack of awareness among farmers for modern crop production methods
- Ineffective extension service
- Insufficient financial resources for investments.
- High level of consumption subsidies resulting in wastages
- Low per hectare income for farmers

Present Agriculture Scenario

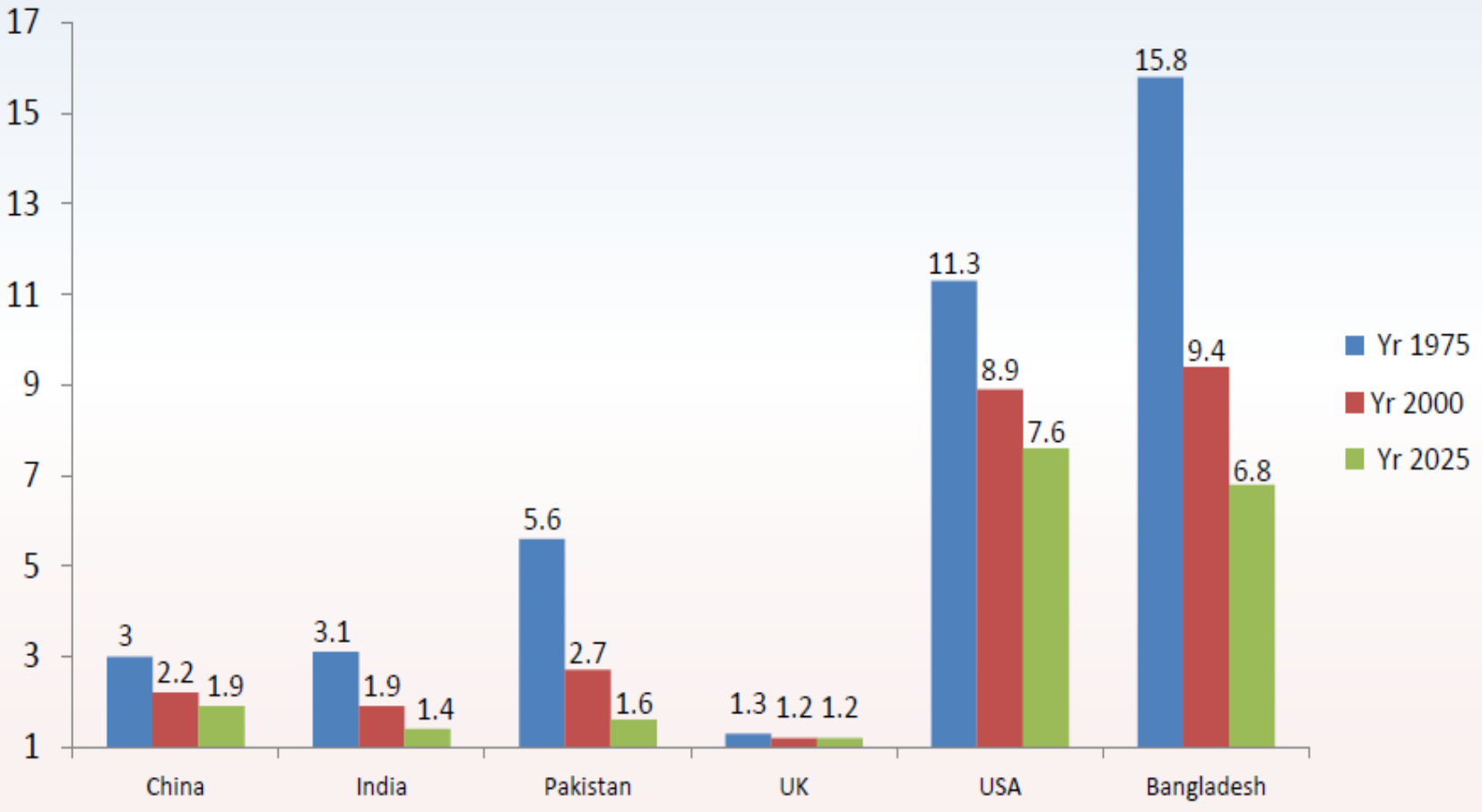


Natural Resources Present Scenario

Resources Distribution

Resource	World	India	% to world
Population, Million	6710	1270	18.9
Land, 000' Km2	149000	3288	2.2
Water, BCM	48632	2085	4.3

Per Capita Water Availability in '000 Cu M



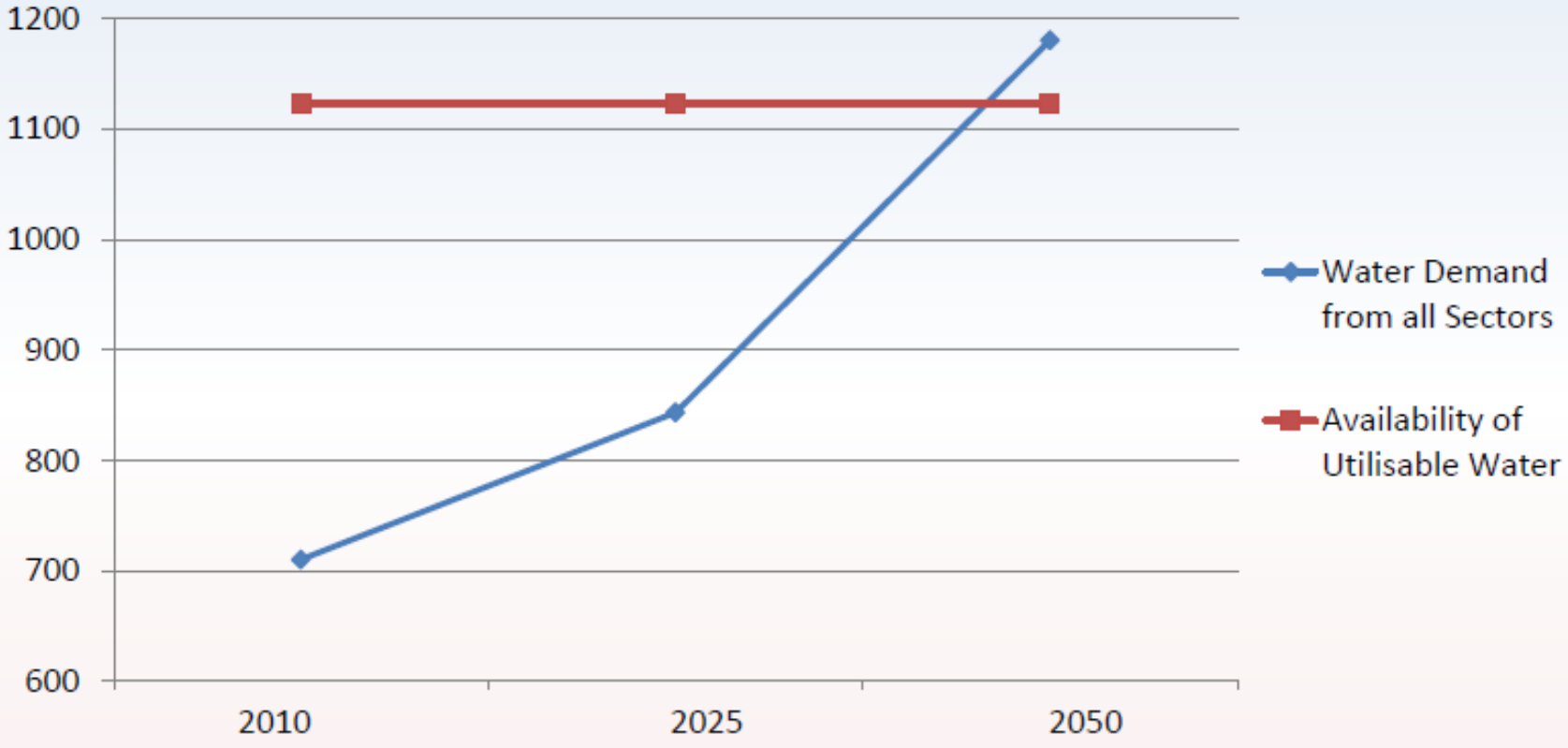
Source : Ministry of Water Resources, GOI

Water Demand and Availability in India

Particulars	Water Demand in km^3 or BCM		
Year	2010	2025	2050
Water Demand from all Sectors	710	843	1180
Irrigation	557	611	807
Drinking water	43	62	111
Industry	37	67	81
Energy	19	33	70
Others	54	70	111
Availability of Utilisable Water	1123	1123	1123
Excess / Short Fall	**413**	**280**	**-57**

Source : Ministry of Water Resources, GOI, New Delhi

Water Demand and Availability in India



Source : Ministry of Water Resources, GOI, New Delhi

Irrigation Potential in India

Sr No	Particulars	India (Area,000 ha)
1	Ultimate Irrigation Potential	139894
2	Irrigation Potential Created by XI Plan	114558*
3	Irrigation Potential Utilized by XI Plan	86156*
4	Percentage Utilization	75.20

Source : Central Board of Irrigation & Power
** Includes Major, Medium, Minor and GW Potential*

Crop Productivity

Source-wise Net Irrigated Area in India

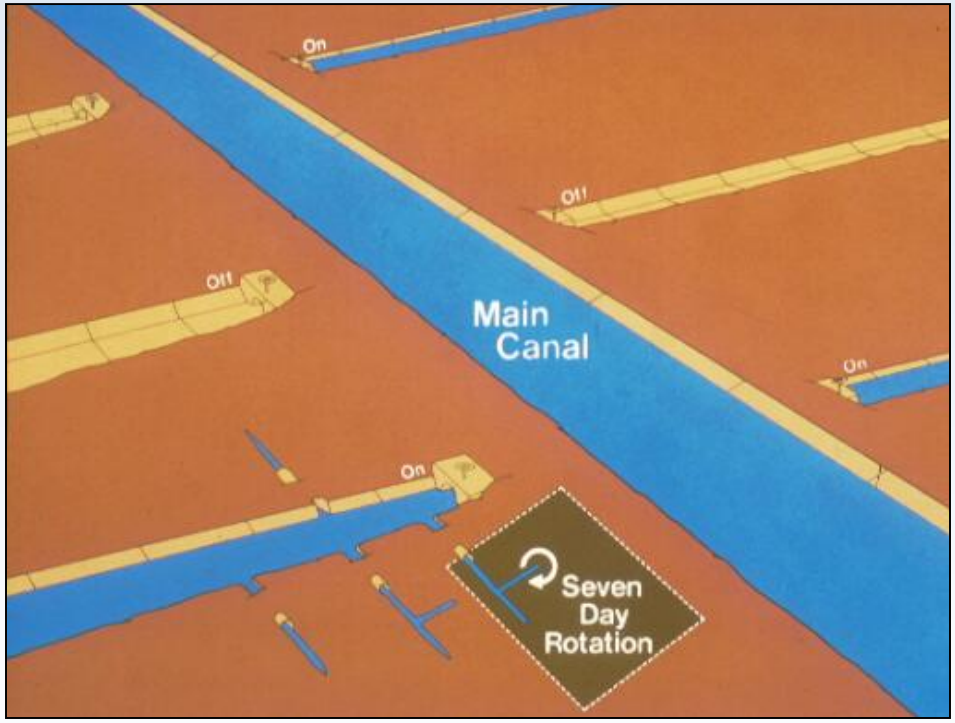
S.No	Source of Irrigation	Net Irrigated Area, Million ha	%
1	Canals	16.697	27
2	Tanks	1.638	3
3	Wells	39.042	62
4	Other Sources	5.880	8
	Total	**63.257**	**100**

Source : data.gov.in (2009-10)

Productivity Under Wells and Canals

Sr.	State	Canals (MT/Ha)	Wells (MT/Ha)	Difference (%)
1	Punjab	3.24	5.45	68
2	Tamil Nadu	2.6	6.53	151
3	Andhra Pradesh	3.42	5.68	66
4	Haryana	3.2	5.7	78
5	Madhya Pradesh	2	2.8	40
6	Karnataka	3.5	4.2	20

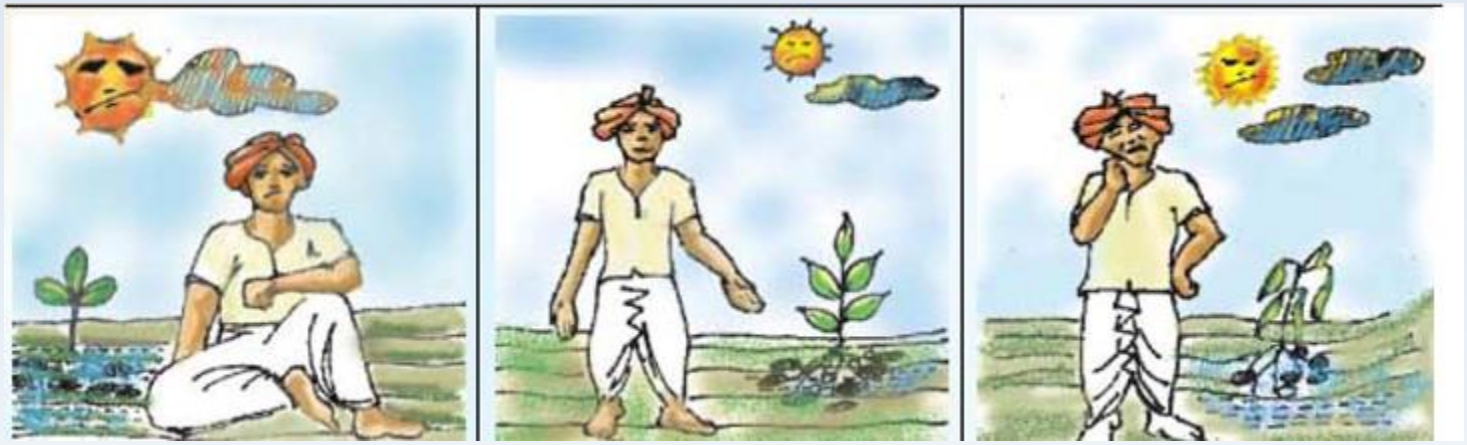
Rotational Water System (RWS) in Canal Irrigated Areas



Distribution of water to farmers under a rotation system called "Warabandi".

The time allocated to each farmer is proportional to the size of his land holding but does not take into account the seepage losses in the water courses resulting less / no water at tail end commands.

Drawbacks Of Rotational Lift Irrigation / Canal Irrigation Scheme with Flood System



First Three Days	Middle Two Days	Last Two Days
More Water Than crop needs, No aeration, Due to non availability of air and over muddy soil crop can not grow in this stage	Upper Layer goes in evaporation, some water adds to groundwater, somewhat aeration in soil , sunlight, grows crop in good Manner.	Water goes down beyond root zones, hence no use of water and air, resulting stunted growth of crop.

Features - Supply Based System

- Method of Water Application : Flood
- Huge Water Losses
- Poor Water Use Efficiency up to 40%
- Unreliable and Inadequate Supply
- Low Value Crops
- Poor Recoveries
- Unviable Projects

Features - Demand Based System

- Method of Water Application : Drip/Sprinkler
- Huge Water Savings
- High Water Use Efficiency
- Reliable Water Supply
- Greater Flexibility
- High Value Cash Crops
- Better Recoveries
- Viable Projects

Reasons for Low productivity in Rotational Lift Irrigation / Canal Irrigation :

UNDER WELL:

- Better Reliability and Control in Well irrigated areas and farmer can try to irrigate based on crop water requirements – That's why productivity under well is more than canal.

UNDER CANAL:

- Unreliability and no control in water flows in traditional rotational irrigation schemes
- Farmers have no control over timing and quantum of supply.
- Excessive use of water results in low productivity
- Excessive use of water also results in infertility of soils and alkaline soils
- Inadequate supply of water at tail end of the scheme results in low productivity.

Progress in Irrigation Water Management

Efficiency

Efficiencies

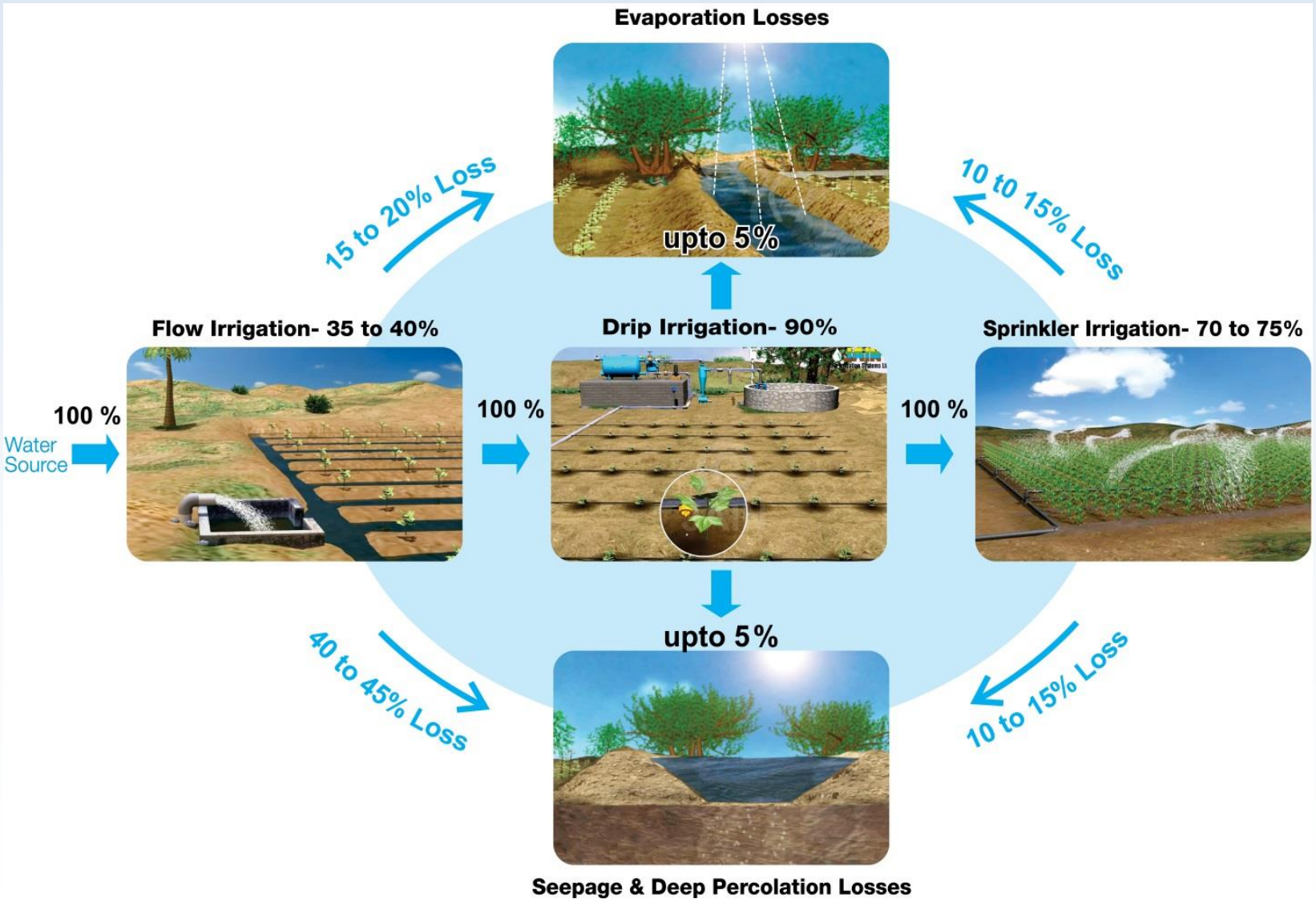
- Conveyance Efficiency
- Field Application Efficiency
- Water Use Efficiency

Conveyance Losses in Canal Networks

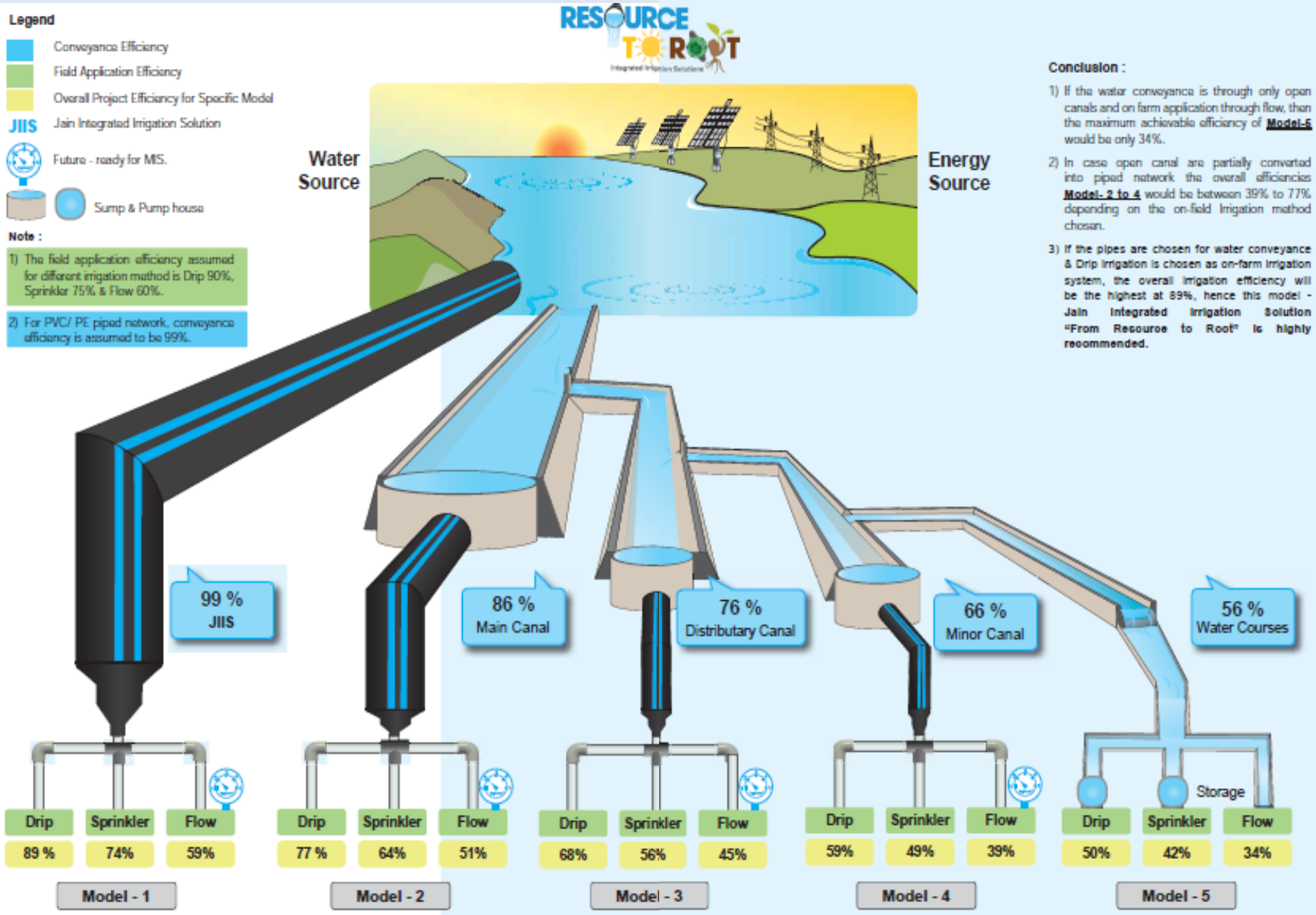
S.No.	Canal Type	% Loss of water	Cumulative % Loss
1	Main canals	6	6
2	Branch canals	8	14
3	Distributaries	10	24
4	Water courses	20	44

Lands lost to canal infrastructure is typically 2-5% of irrigated command area created. (The World Bank)

Water Losses in Different Irrigation methods

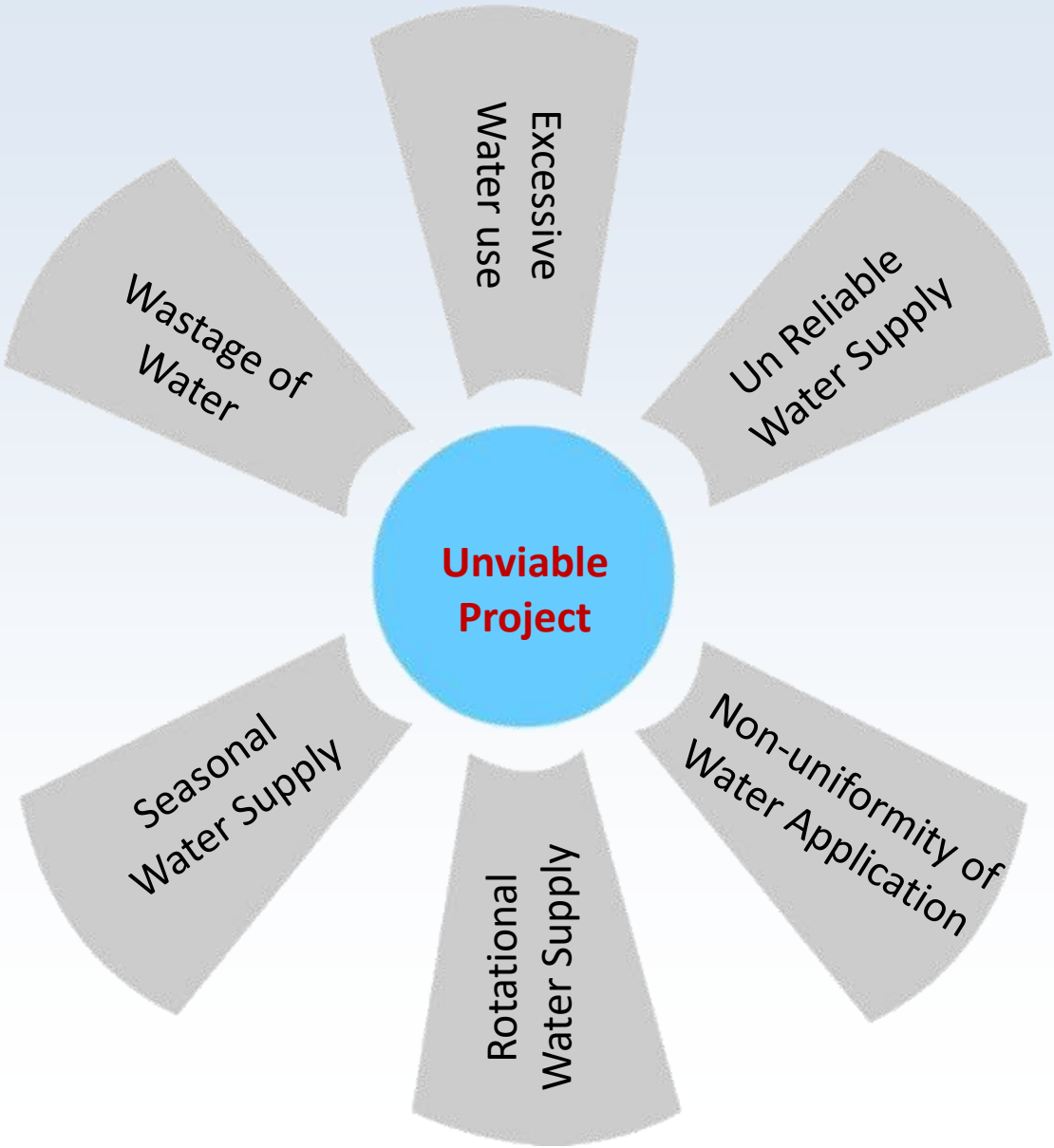


IRRIGATION EFFICIENCY & LOSSES



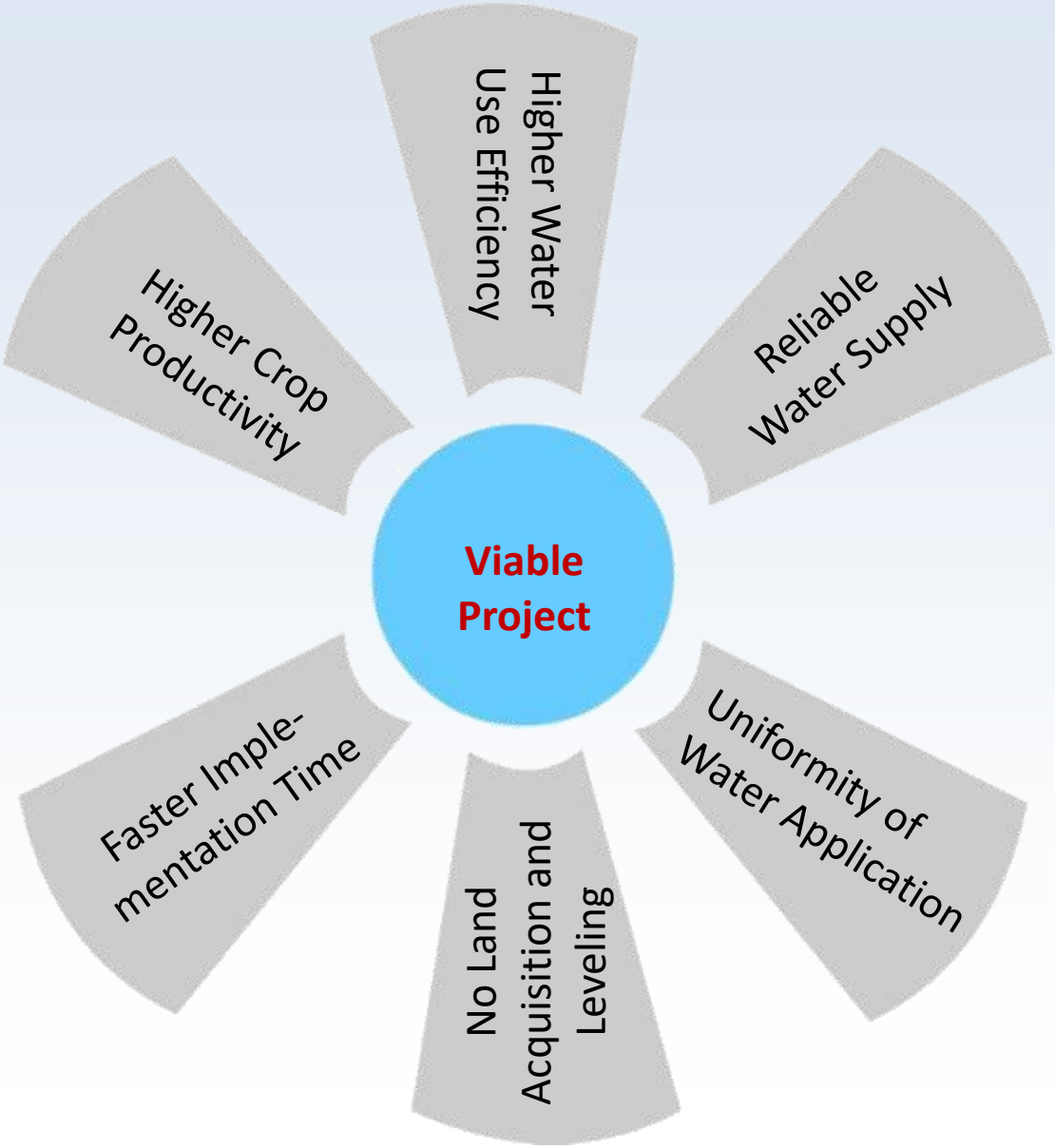
Limits & Constraints – Present Irrigation Problems

Issues with Current Irrigation Practice

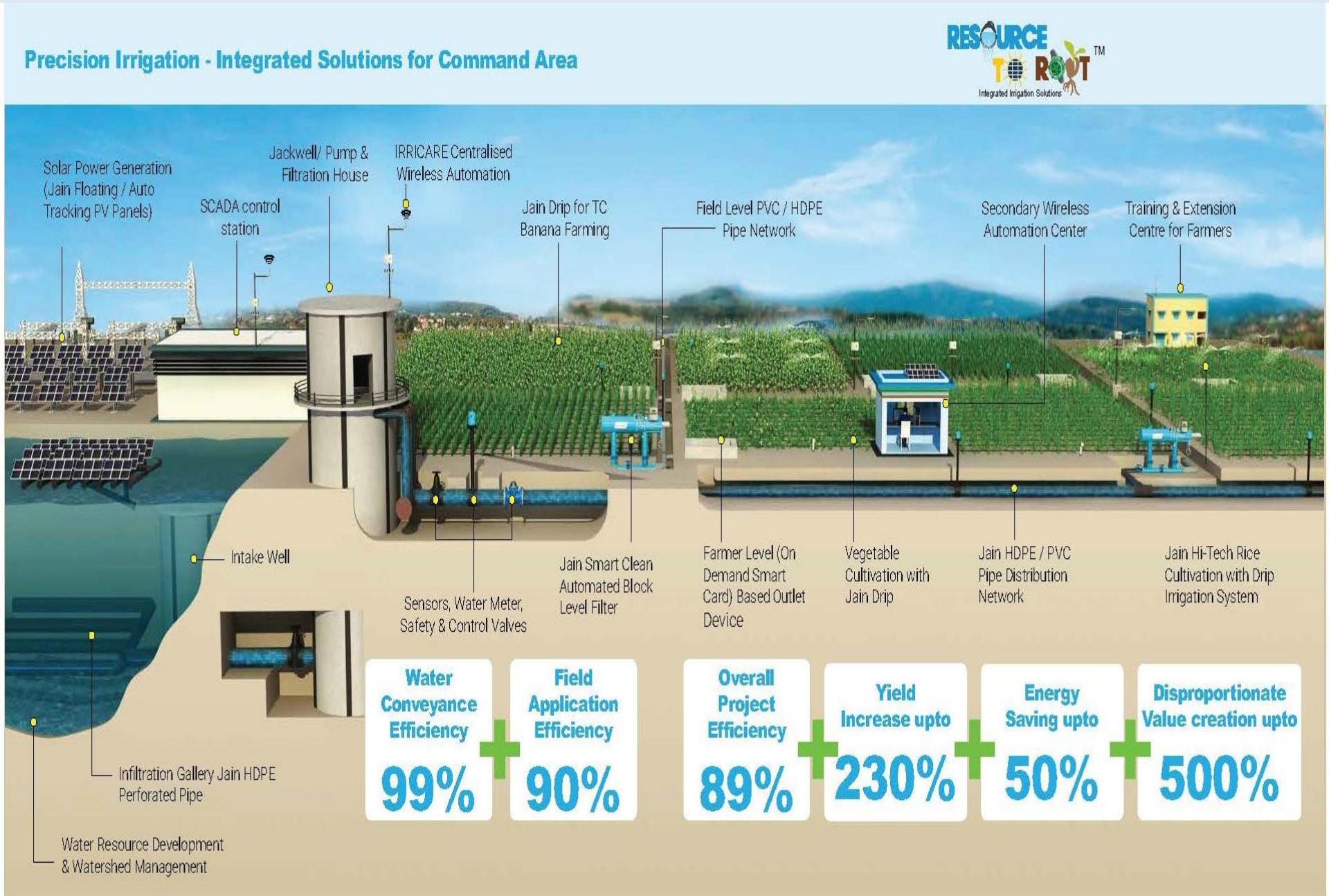


Solutions

Integrated Irrigation Solution (Resource to Root) / On Demand Irrigation Network



Solutions for Present Irrigation Problem



Difference Between Traditional Canal Irrigation and On Demand Irrigation Network

Sr No	Parameter	Traditional Canal Irrigation	On Demand Irrigation Network
1	Approach	Supply Based	Demand Based
2	Principle	Water is applied to the field on rotational basis	Water is applied to the crops as per their water requirements
3	On field system	Flow Irrigation	Micro Irrigation or sprinkler irrigation
4	Water Use Efficiency	Upto 40%	Upto 80 - 90%
5	Water Losses	Heavy evaporation and seepage losses	No wastage of water
6	Land Acquisition	Land acquisition is required for canal construction	No land acquisition is required
7	Construction Time	Longer time required to construct canals	Shorter time required to lay pipelines
8	Gestation Period	Longer Gestation period ranges from 5 - 20 years	Shorter Gestation period ranges from 2-5 years
9	Maintenace	Regular maintenace required for desilting , canal repairs etc	Minimum maintenance required once you install filters/desilting mechanism
10	Cropping Pattern	Farmers are inclined to take low income crops due to non reliability of water supply through canals	Farmers can take high income crops because the water supply is assured
11	Yields	Yields are lower because of non timely water supply or no water supply	Better yields are assured because of favourable soil moisture conditions all the time and fertigation.

Difference Between Traditional Canal Irrigation and On Demand Irrigation Network

Sr No	Parameter	Traditional Canal Irrigation	On Demand Irrigation Network
12	Fertilizer Saving	Fertilizers are applied by broadcasting method,hence there is huge wastage of fertilizers and efficiency is also lower	Efficiency of fertilizer application is higher because of fertigation technique through micro irrigation. Savings in fertilizers are possible
13	Land Levelling	Land Levelling is required for flow irrigation since it is a gravity based irrigation	No land levelling is required since micro irrigation is pressurized irrigation
14	Use of Bad Quality Water	Salty/saline water deteriotes soils	Use of salty/saline water possible without deteriotion of the soils
15	Soil Health	Soil health deteriotes after prolonged use of this method	Soil health/fertility is maintained even after prolonged use
16	Quality Produce	Many times quality of produce is not upto mark	Export quality produce is possible
17	Water at Tail End	Many times farmers do not receive water at tail end	Uniform water application because of pressurized systems
18	Social Justice	Not much	Possible because of uniform distribution

What is Integrated Irrigation Solution (IIS)?

- **Integration of following components is referred as IIS**
- Development of Water Source.
- Conveyance of water from source thru closed piping up to farm gate.
- On farm Irrigation thru Micro Irrigation which applies water to roots.
- Provision of Pumping, Power* network, Automation & Civil work.
- O & M, training & capacity building of beneficiaries through WUAs.

Why IIS ?

- Conventional Canal Systems achieve low - 30% irrigation efficiency.
- It is supply based rotational system.
- It involves losses through evaporation, seepage, deep percolation and conveyance.
- It offers large coverage but poor productivity and mono-cropping.
- Long gestation and lengthened execution results in no / or poor ROI.
- Inherent huge challenges of Land acquisition, Rehabilitation & Soil degradation.
- Significant under utilization of canal capacity due to variety of reasons.

Conclusion:

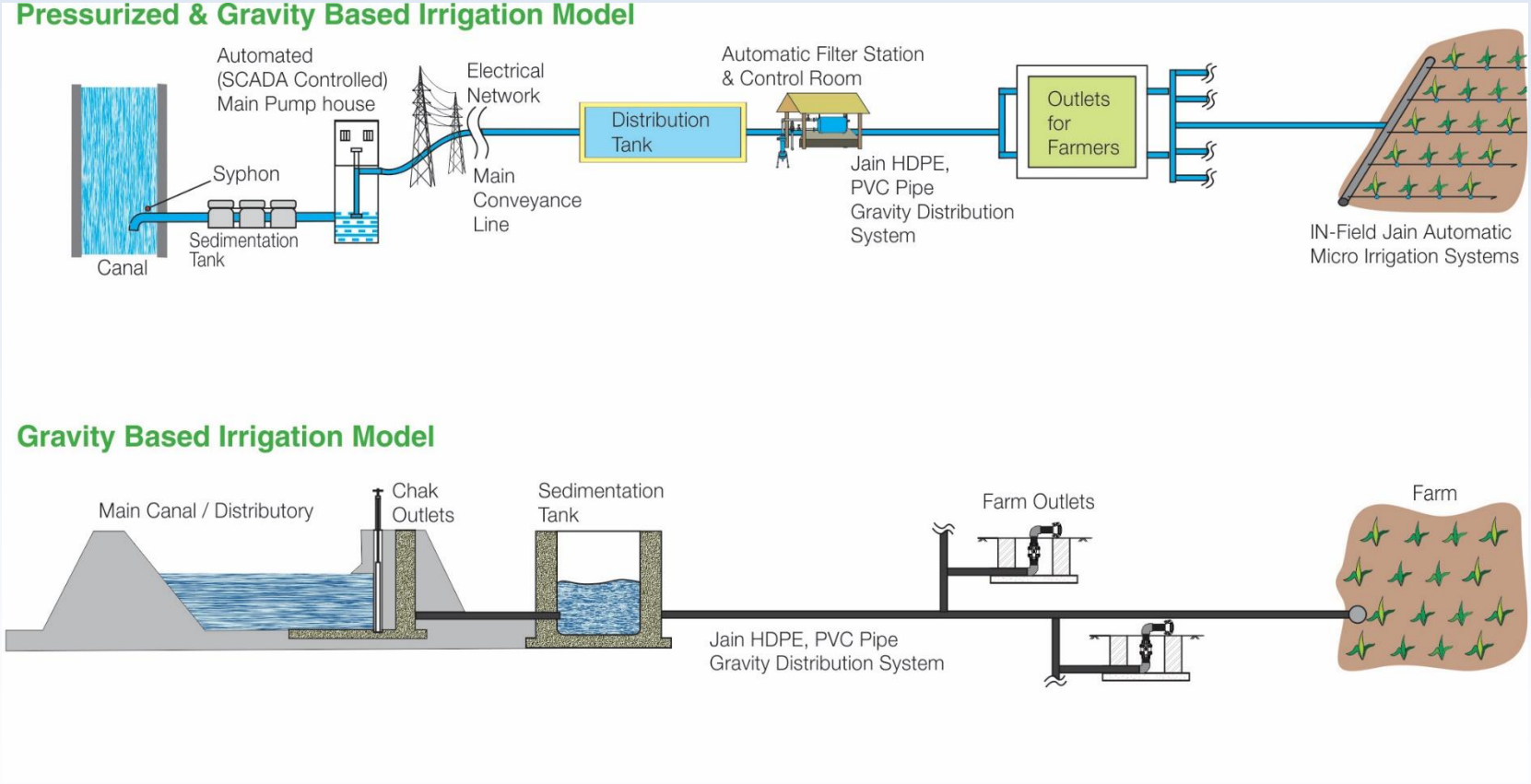
- In the fast track & ever changing socio-economic environment, such inefficient systems create inequities & tensions amongst the stake holders.

IIS - Components

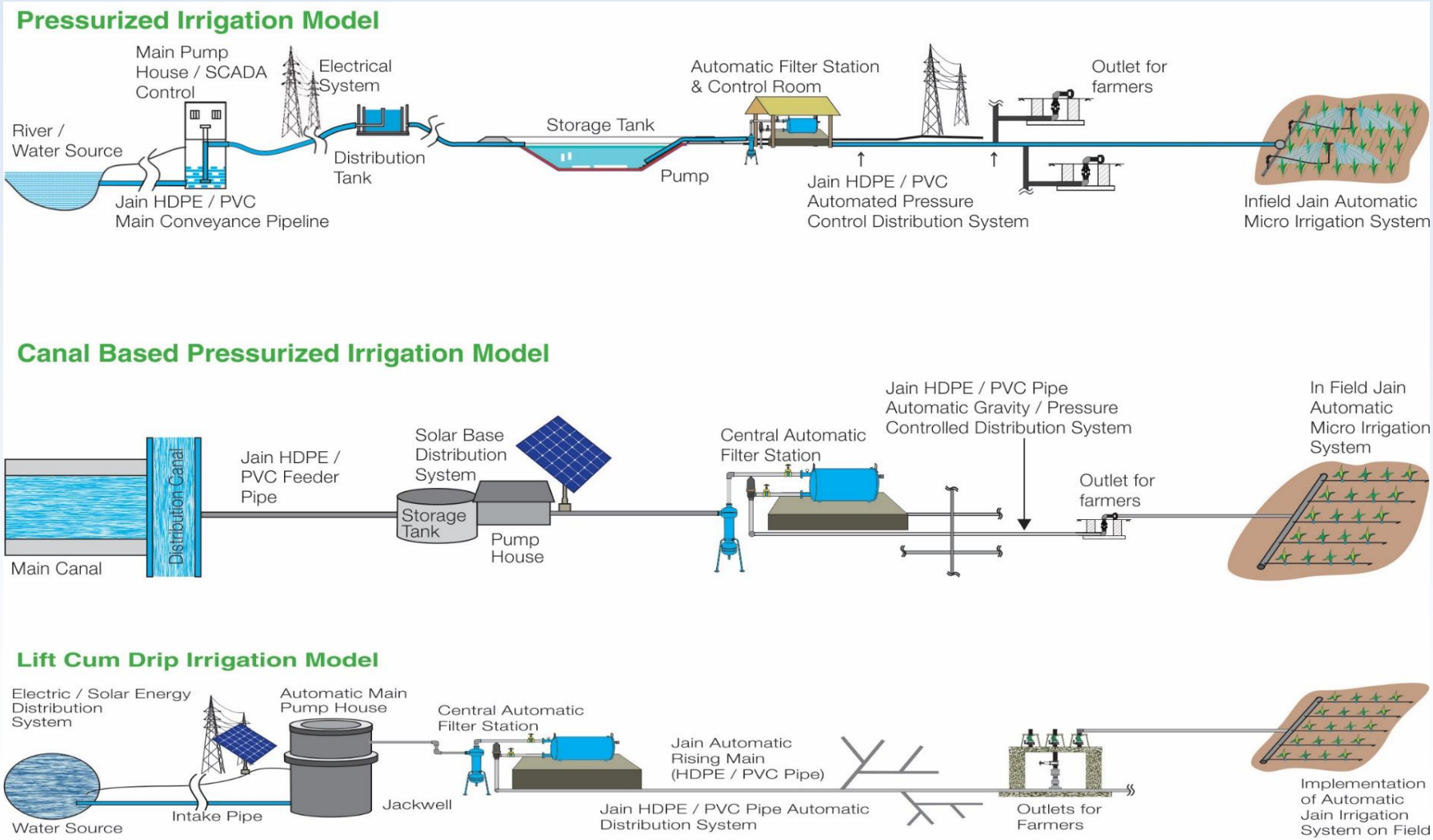
1. **Hardware :** Water Source, Storages, Head works, Pipelines, MIS Network, Pumping Machinery, Automation, Electrical etc.

2. **Software and Services:** Survey and Planning, Designing, Installation, Commissioning, After sales services, O and M and Training

Few options of Integrated Irrigation Solutions (IIS)



Few options of Integrated Irrigation Solutions (IIS)



IIS – Challenges and Solutions

Challenge	Solutions
In canal commands water is available at intervals ranging between 10 to 30 days· whereas in micro irrigation frequent watering is required.	Supply of water through canals at more regular intervals, preferably on continuous basis.
	On farm storage facilities on individual farms have to be created·.
	Community storage facilities for groups of farmers·, village tanks and water harvesting facilities to be used as storages·.
	Conjunctive use of groundwater i.e. whenever canal water is not available farmers have to use their water wells.
	Piped distribution network and use of micro irrigation system which allows irrigation at frequent intervals.
Cultivation of low income crop like cereal etc..	Alternative high income crops need to be recommended and promoted.
	Crop sequence and rotation need to be evolved so as to improve income from agriculture.
	Subsidy support to farmers for adoption of piped distribution networks.
No or low reliability of water supply, leading to cultivation of low income crops.	As water availability from canals is not reliable, farmers resort to low risk crops with which their financial loss would be minimum. Assured availability of water will enable them to take up high income crops
	Conjunctive use of groundwater due to which farmers can opt for high income crops.

IIS – Challenges and Solutions

Excessive sedimentation and debris in canal waters	On farm storages, community storages, etc., in order to allow for settlements of sediments and debris in canal water.
	Use of suitable filtration systems with automatic backwash arrangements
Mismatch of water requirement among farmers at a given point of time .	Specific/mono cropping patterns with limited choice for group of farmers should be promoted
	Predefined uniform cropping patterns and uniform planting times at least for small groups of farmers will have to be followed
Variations in crops being grown from season to season and year to year	Introduction of perennial crops, wherein cropping patterns can be stable for long periods.
Variation in the use of irrigation systems leading to increase or decrease in system pressures, which damages the system components. Such a variation in use of the system will also result in wastage of pumping energy	Protection equipments such as Pressure Relief Valves need to be included.
	Pumping units shall contain Variable Frequency Drives(VFDs) in order to vary the energy requirements based on system demand.

IIS – Challenges and Solutions

Non-cooperation among farmers on an outlet or a minor	Automation ensures precise timely delivery of water to the plants without physical presence of the farmers in the field .
Reluctance of implementing authorities for acceptance of technology due to unawareness	Awareness meetings to bring the change in mindset of implementing authorities.
Non availability of funds with the farmers to bear the system costs	Subsidy assistance to be extended.
	Easy loan and credit facilities to be made available.

Features of IIS

Integration of following components is referred as IIS

- Development of Water Source : Such as Reservoir, Sump, Well, Tube-well or River rejuvenation etc.
- Construction of necessary Civil works : Such as Intake Pipe, Intake Structure, Sump, Pump House, MDC, Delivery Chamber, Outlets etc.
- Conveyance of water from source through closed piping up to farm gate: This can be through use of HDPE and/or PVC Pipes.
- On farm Irrigation through Micro Irrigation which applies water to roots : This can be Drip Irrigation or Sprinkler Irrigation depending on the type of crops, farmers cultivate.
- Pumping Machinery & Power (Electrical / Solar) network : They can be Electrical or Solar depending upon source of energy.
- Automation System to monitor & operate the scheme : This can have different levels, it can also be time based, volume based or real time based.
- Maintenance of the project : Normally the period is of 2 to 5 years. During the maintenance period providing required service is to company's account, however spares and other components are supplied by the company at cost.
- Training & capacity building of beneficiaries through WUAs : This is very important, JISL conducts training and capacity building programmes. The training can involve different crop modules or systems training.

Advantages of IIS

- **Suitable for all climates and topographical conditions :** Jain Integrated Irrigation Solution can be executed in different climatic or topographical conditions including Kashmir to Kanyakumari or even arid region of Kutch/Rajasthan to Cherrapunji in North-East.
- **Equitable distribution rendered possible :** Due to pressurized pipe conveyance this can be made feasible.
- **Volumetric distribution made feasible:** On pipeline one can install water meter to make this feasible.
- **Opportunity to cultivate high value & varied crops created :** Due to reliability of water supply, there is an opportunity to cultivate high value long duration cash crops in command area.
- **Reduced gestation period assured :** The JIIS can be implemented within a shorter time than conventional projects, hence reduced gestation period is feasible.
- **Economical use of fertilizers & other inputs promoted :** Fertilizers are given normally through fertigation equipment hence precise application of fertilizer is possible.
- **Soil health is maintained**. Soil erosion & degradation is avoided.
- **Economical and cost effective solution** which ensures shorter pay back.
- **Automation ensures** precise timely delivery of water to the plants without physical presence of farmers in the field. It also ensures equality in water distribution and reduces the cost of agri input.
- **Integrated and holistic approach** and project design encourages co-operative spirit and behaviour among the farmers.
- This is the ONLY sustainable solution to overcome drawbacks of canal irrigation & improve water use efficiency.

IIS – A Path breaking Solution

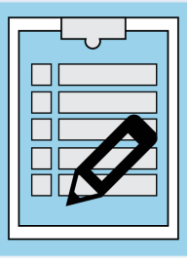
- Investigation and Survey
- Engineering Design
- Material Supply
- Execution
- Operation and Maintenance
- Training and Capacity Building
- Handing Over
- Extension and R & D support
- Monitoring and Evaluation

IIS- Methodology

Conceptualisation

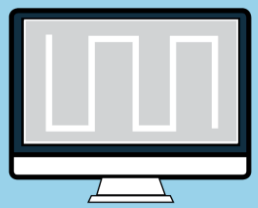
- Preliminary reconnaissance survey.
- Benchmarking survey.
- Problem identification and need assessment of the project area.
- Assessment of feasibility.
- Preparation of feasibility reports.

Survey, Data Collection & Analysis



- Topographical Survey.
- Collection of soil and water samples and their analysis.
- Collection of engineering, climatic and agronomic data.
- Assessment of water sources.
- Assessment of power sources.

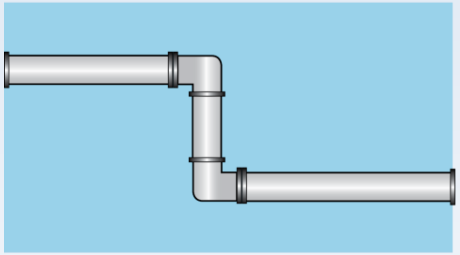
Planning, Design & Engineering



- Hydraulic and agronomic design of the project.
- Preparation of DPR (Detailed Project Report).
- Formulation of Water User Groups (WUG).
- Supply of material as per Bill of quantities.
- Verification and validation of designs.

IIS- Methodology

Installation & Commissioning

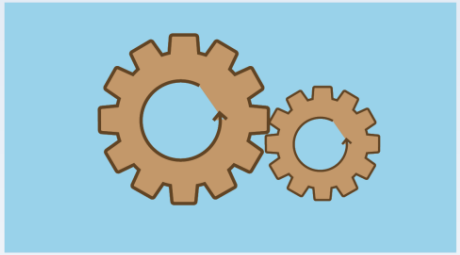


- Installation of hydraulic system as per project design.
- Erection of civil structure (e.g. pump house, control room, sumps etc..) as per project requirement.
- Installation of control & operation system like automation, control valves, safety valve etc..
- Hydraulic testing of the project.
- Trial run of operation and control system.

Capacity Building & Support

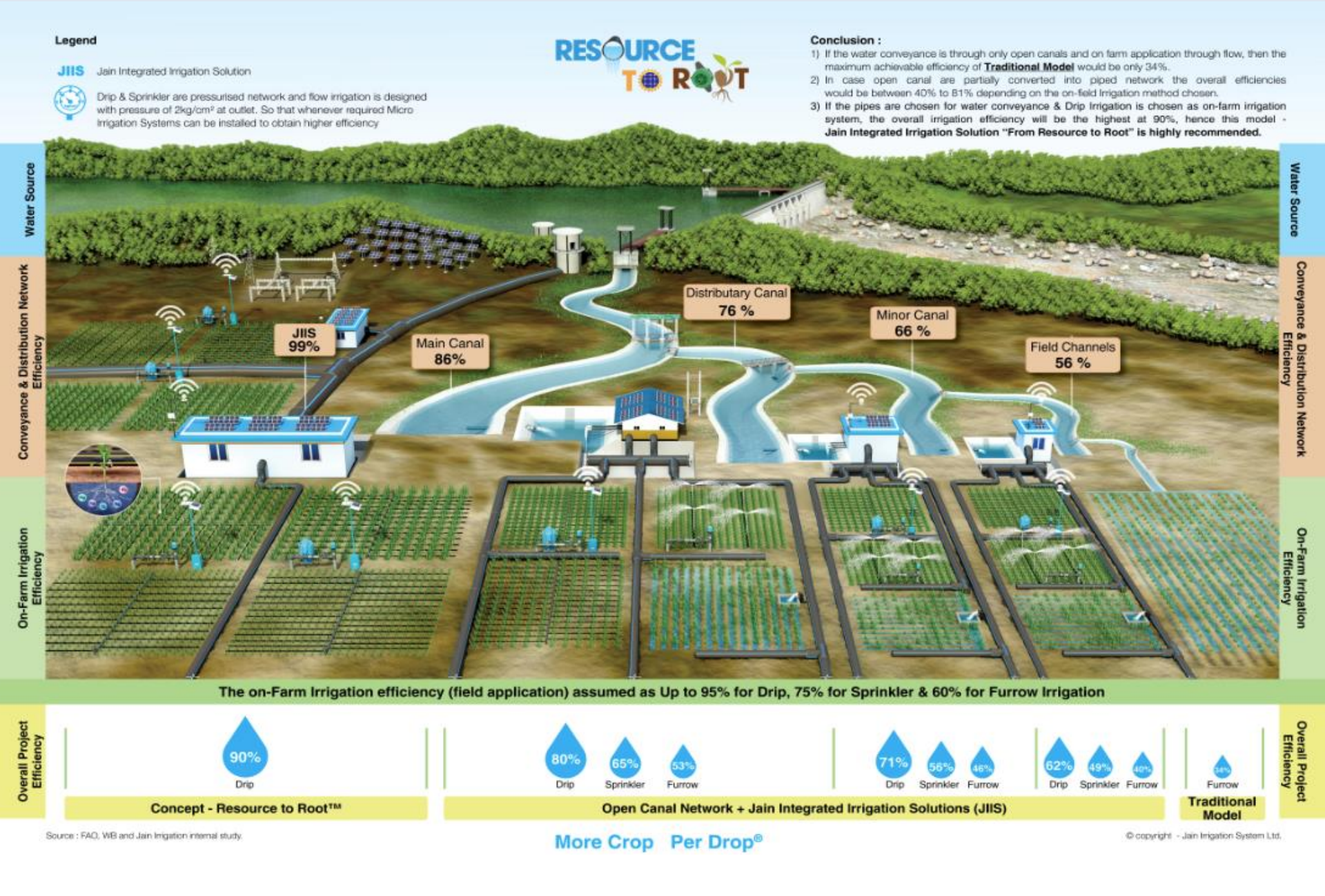
- Agronomic Support & Training for WUG's & Farmers.
- Engineering support
- Extension activities.
- Training on GAP (Good Agricultural Practices).
- Support for market linkage & trading farmers produce as per project requirement.
- Publishing literature in local languages.
- Establishing demonstration farms in project area.

Operation & Maintenance

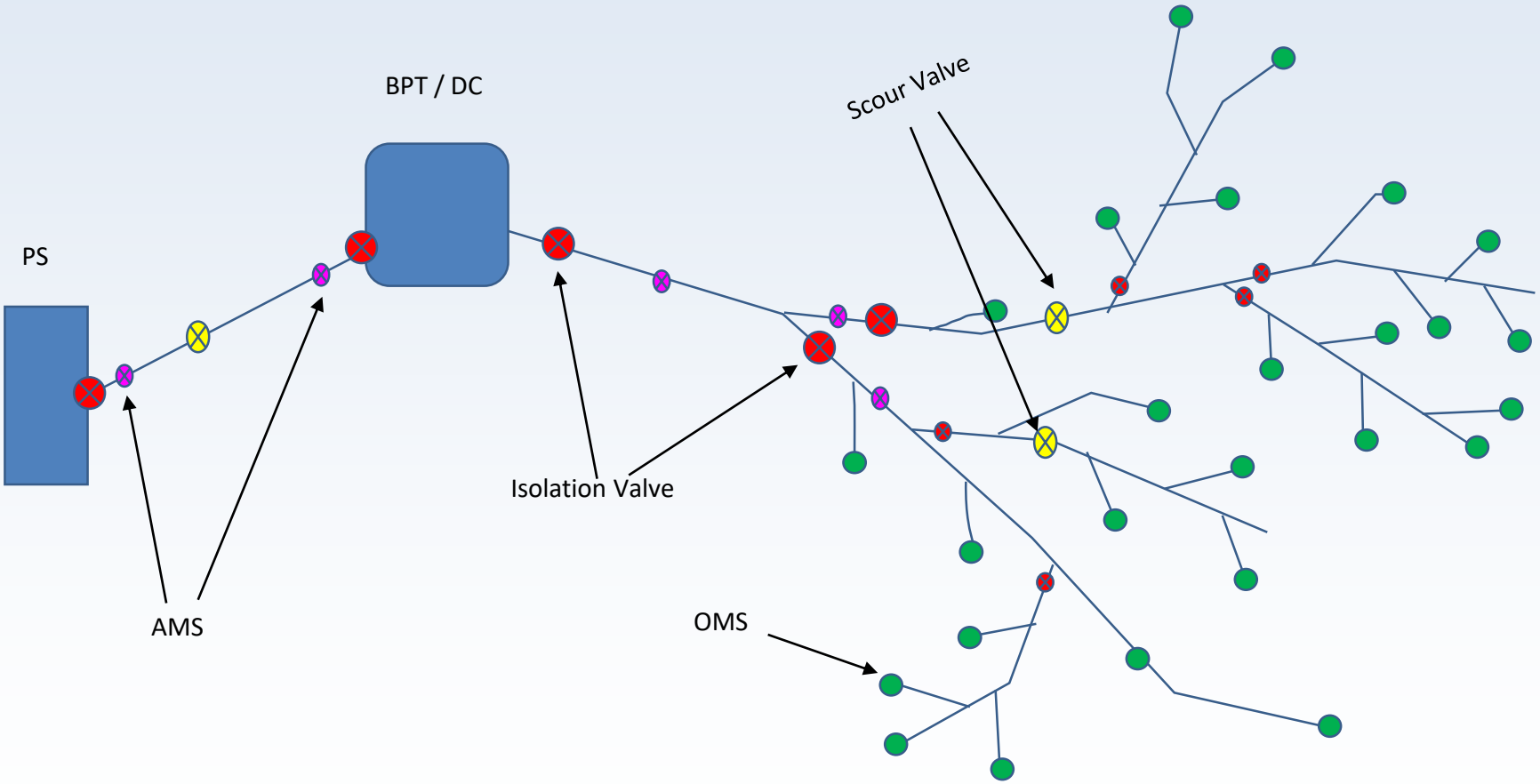


- Operation and maintenance of the project for pre-specified period.
- Successfully handing over the project to WUG.

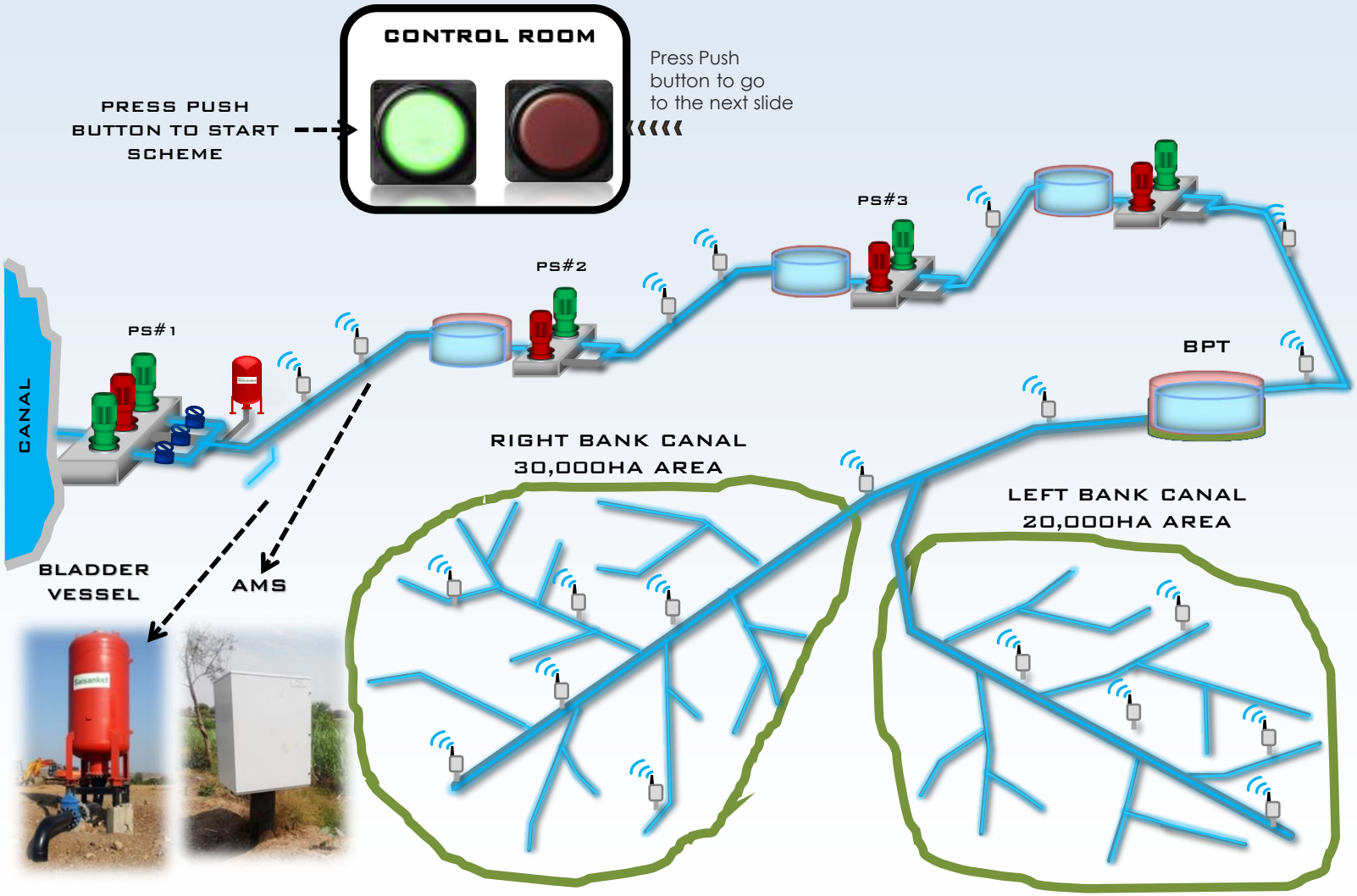
Technology for Efficiency Improvement



GENERAL LAYOUT FOR NETWORK SEGMENTATION



Operation Details of Irrigation Project

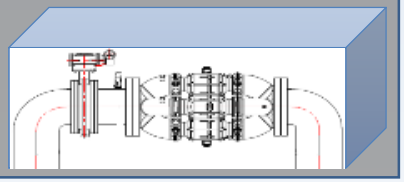


Distribution Network From RMS to OMS

Remote Management System (300 Ha)

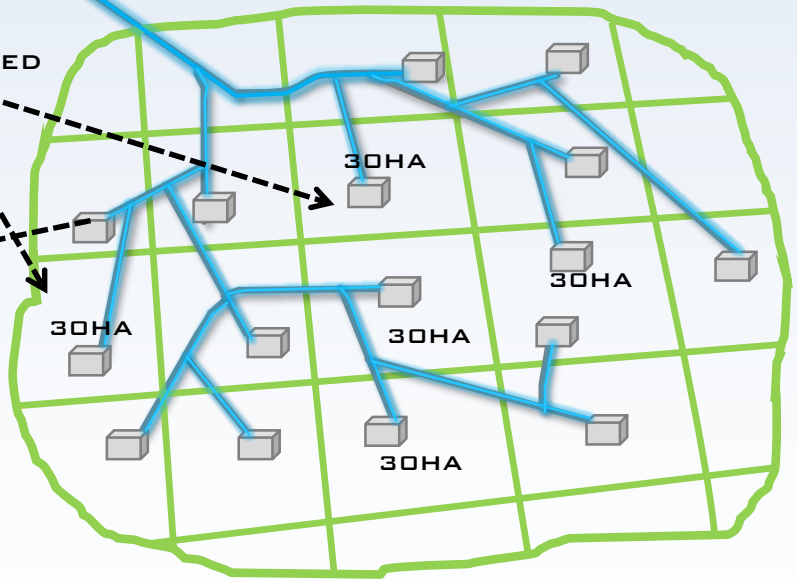
*Remote Control

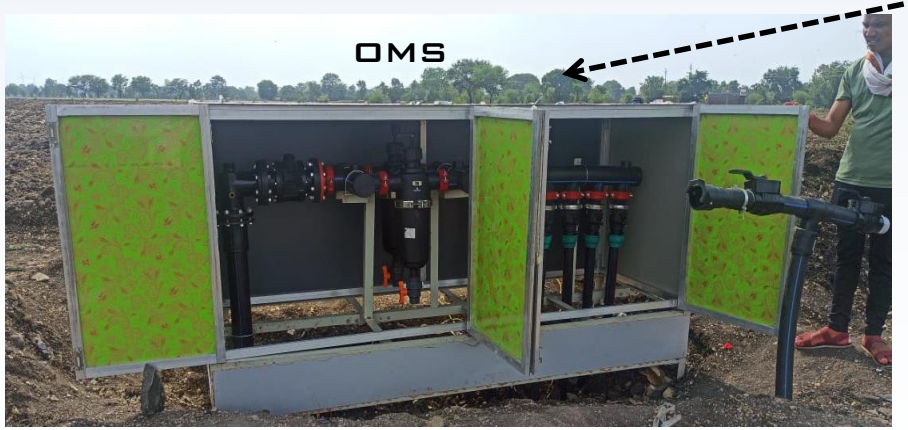
* On/Off
* Flow Discharge Monitoring
* Pressure Monitoring



REMOTE MANAGEMENT SYSTEM

COMMAND AREA DIVIDED INTO 30HA EACH





REMOTE MANEGEMENT SYSTEM

1. Remote Management System for average 300 Ha on Main Line is considered for better operation and Maintenance.

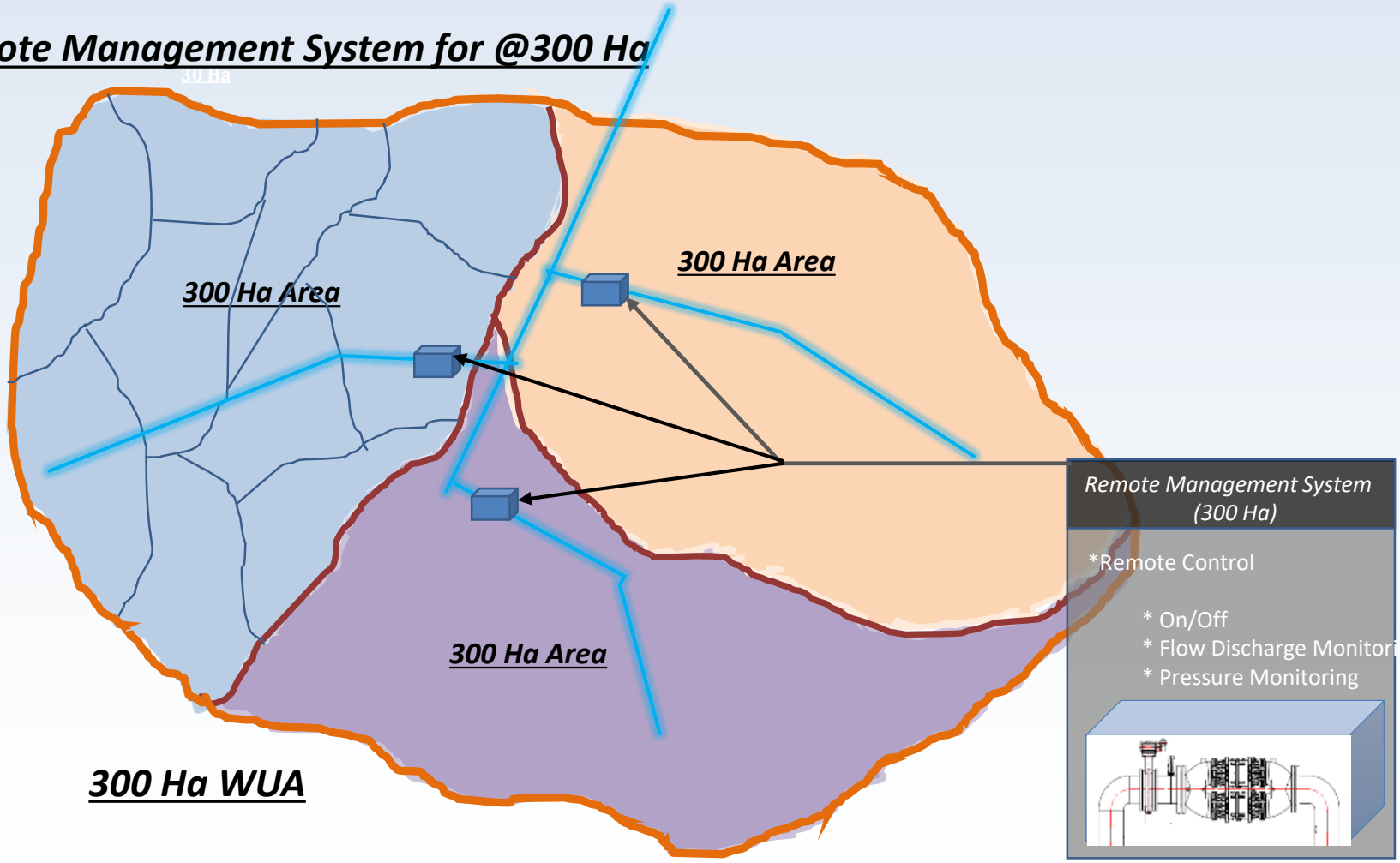
2. Remote Management System will isolate all the Outlet Management Systems covered under its network, whenever required.

3. This Smart system will monitor bursts and shut down conditions from remote in the event of bursts/Maintenance with alert message to concern Authority.

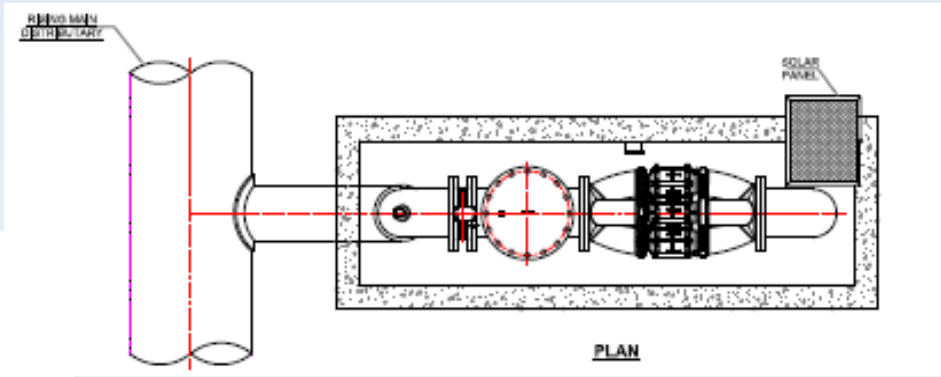
4. This Remote Management System will work without Electric Energy and using Wireless communication therefore will work efficiently and effectively.

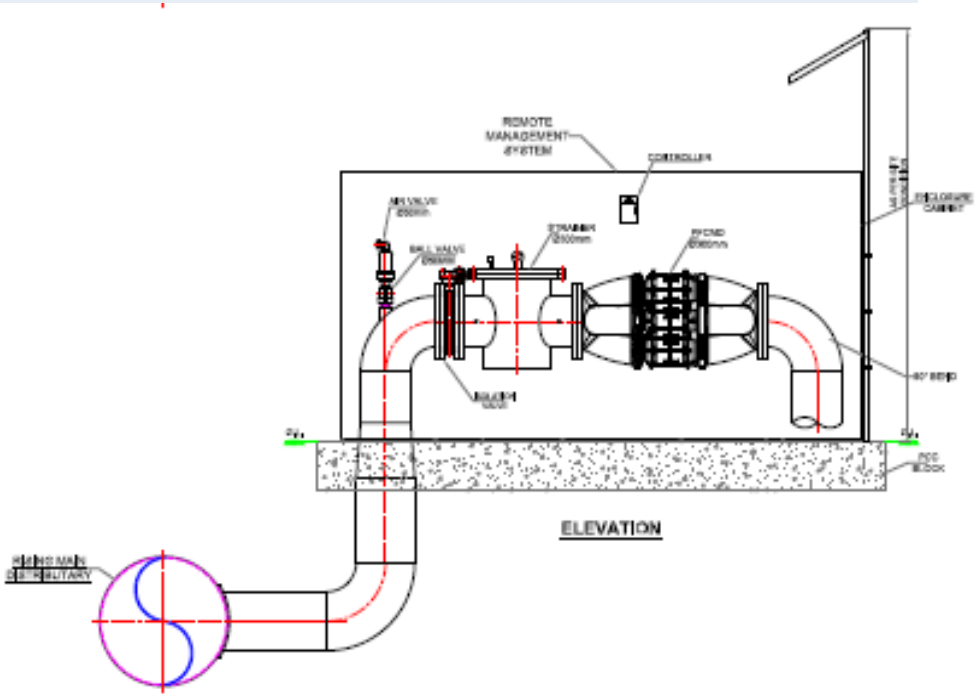
RMS – 300Ha

Remote Management System for @300 Ha

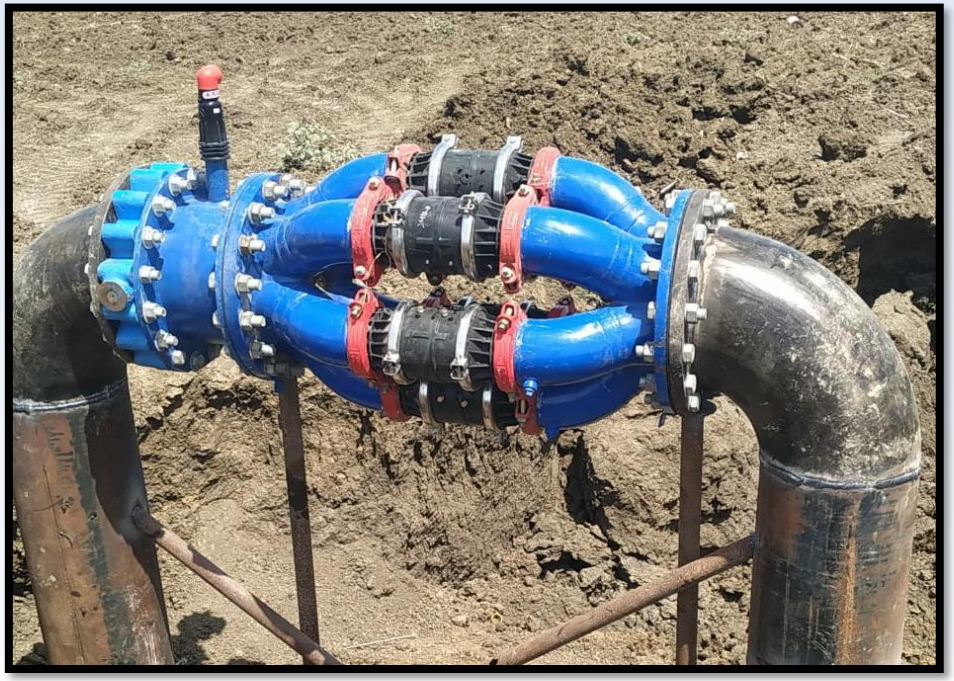


Plan of Remote Management System



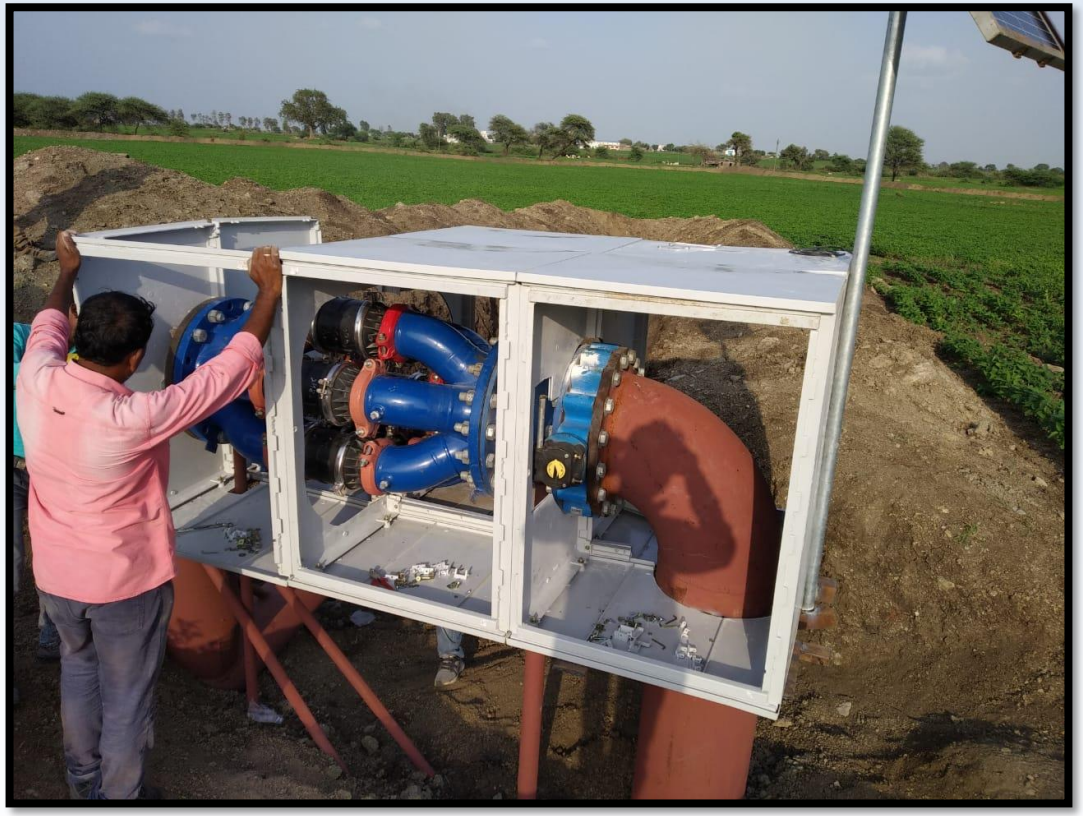


Remote / Sabotage Management System



RMS Installation Photos for Reference

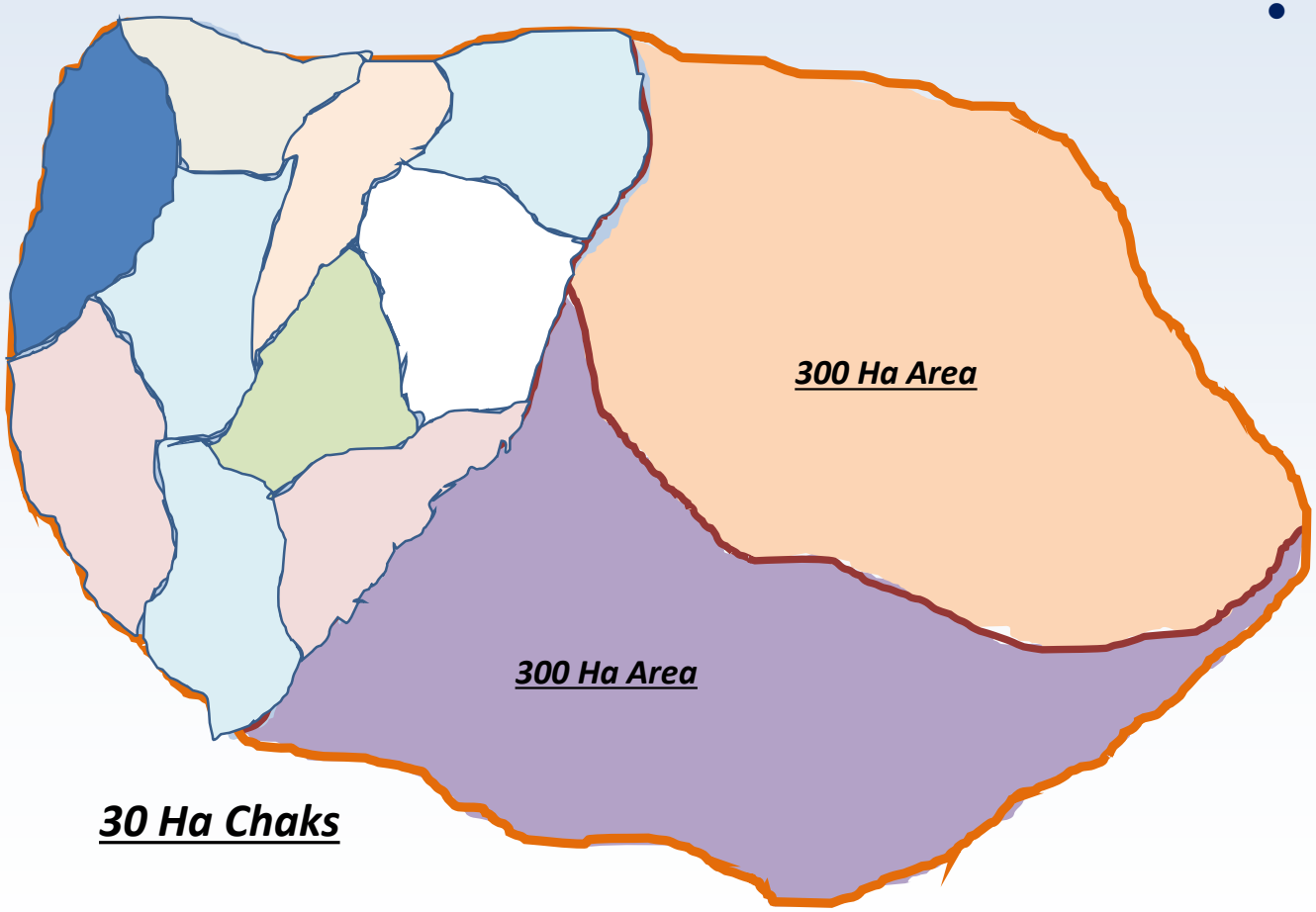
Remote / Sabotage Management System



RMS Installation Photos for Reference

OMS – 30Ha Chak

Outlet Management System for @30 Ha Chaks



- **OMS system** comprises of the branches taking off from 300 ha WUA to 30 ha chaks and then the further network from 30 ha chak to 1 ha field outlet. It is the most vulnerable and lengthy system requiring high quality participatory irrigation management for efficient operation of system.

OUTLET MANAGEMENT SYSTEM

FEATURES :

- Equitable Distribution of Water irrespective of distance from the pumping station or Elevation Difference
- Record, Monitor and Control of the flow Delivered as per Quota/Demand
- Flow control to meet the variation in crop water demand
- OMS should be capable to Change/Configure the flow setting as and when required from remotely through WEBSCADA without visiting the site.
- Avoid the Draining of the distribution Network
- Localize data Storage & control
- Operation on Solar Power with battery backup, hence No Need of any External Electric Energy
- Wireless Communication for data transfer
- Protective Enclosure capable of giving Vandalism Alert
- To reduce air blockage Air Valve is included in the OMS Unit.

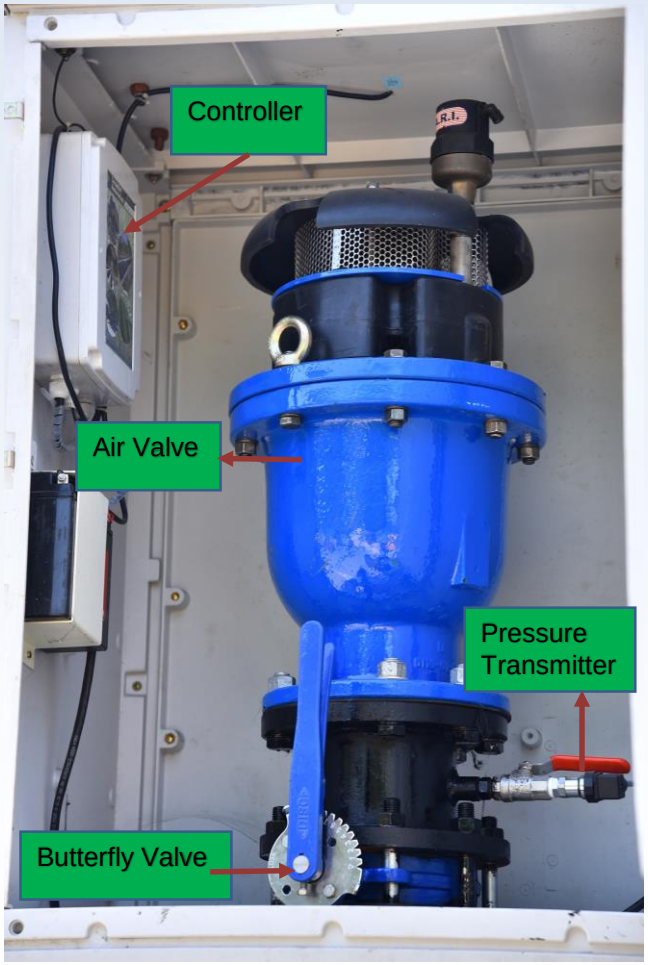
AIR MANAGEMENT SYSTEM (AMS)

- Air Management System is installed on the pipeline at suitable location. It is necessary for effective working of system as the chocked air will lead to water hammer and less flow.

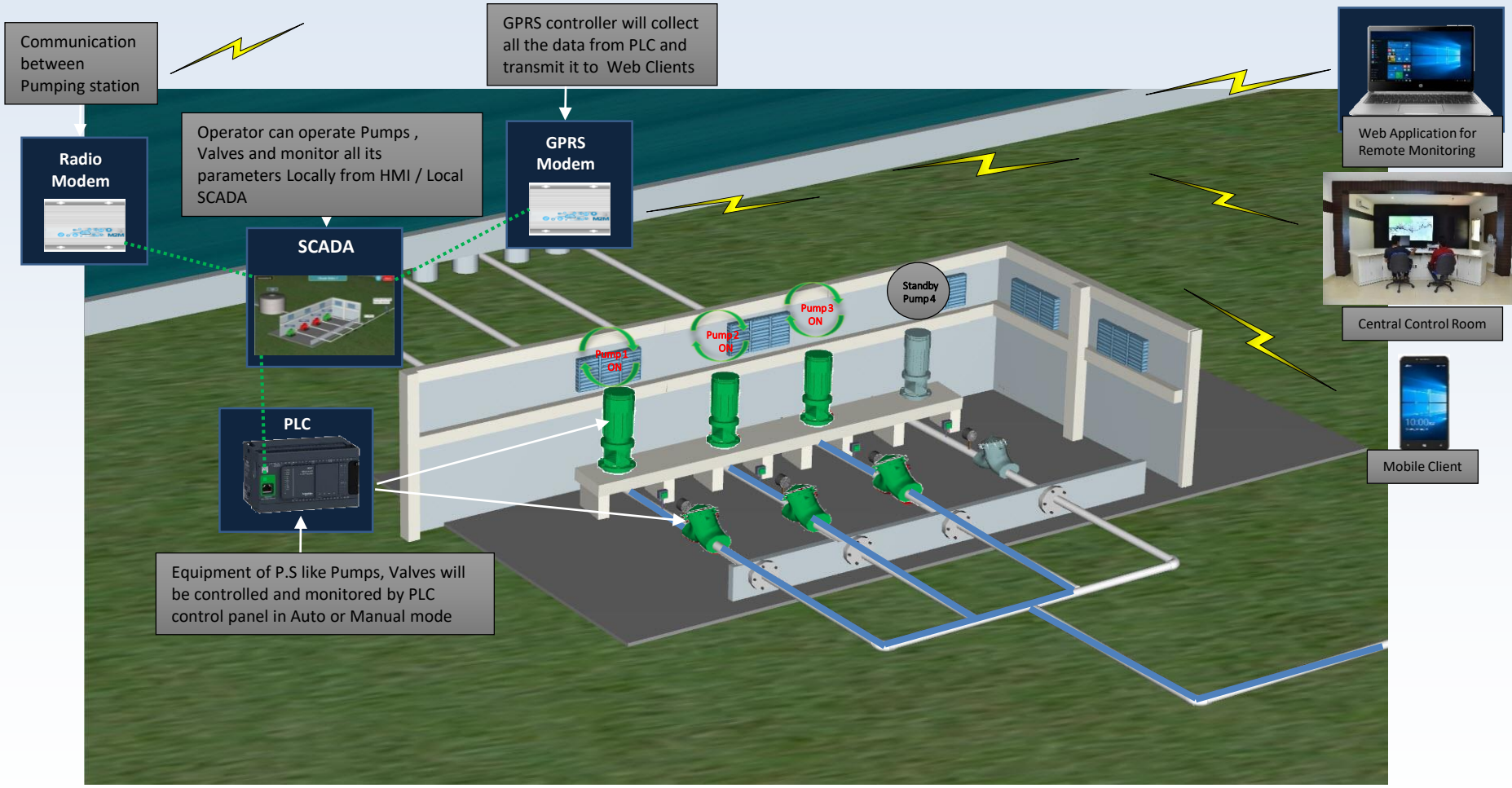
FEATURES OF AIR MANAGEMENT SYSTEM (AMS)

- Air Management System will monitor Pressure and also assist in monitoring of pipeline Burst and water theft.
- Air Management System has Tamperproof Enclosure System with Vandalized Alert
- Air Management System is also capable of operating as flush valve in the event of requirement of drawing the water for fire incidents etc.
- Controller features and communication methodology of AMS Controllers is same as OMS controller

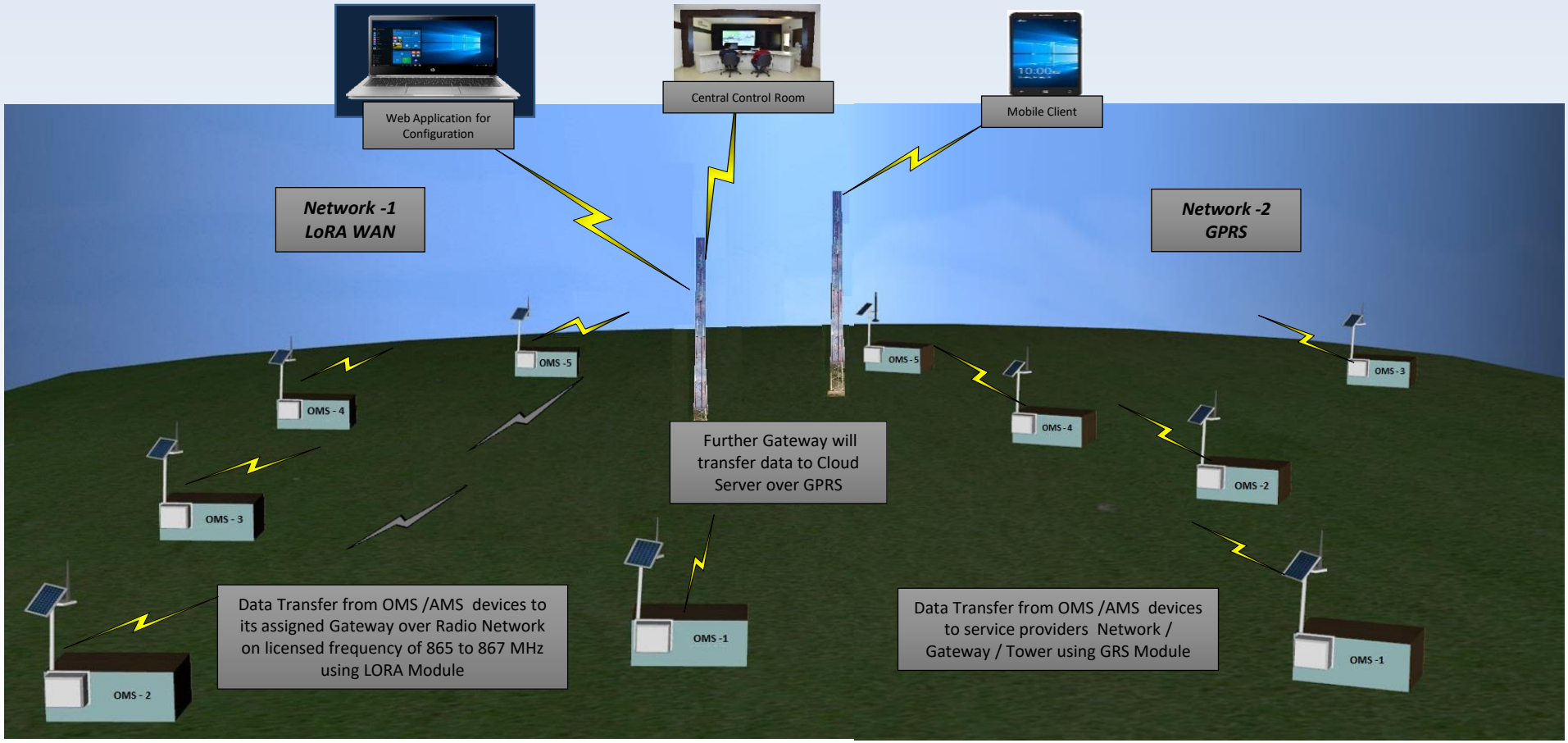
INSTALLATION OF AIR MANAGEMENT SYSTEM AT SITE



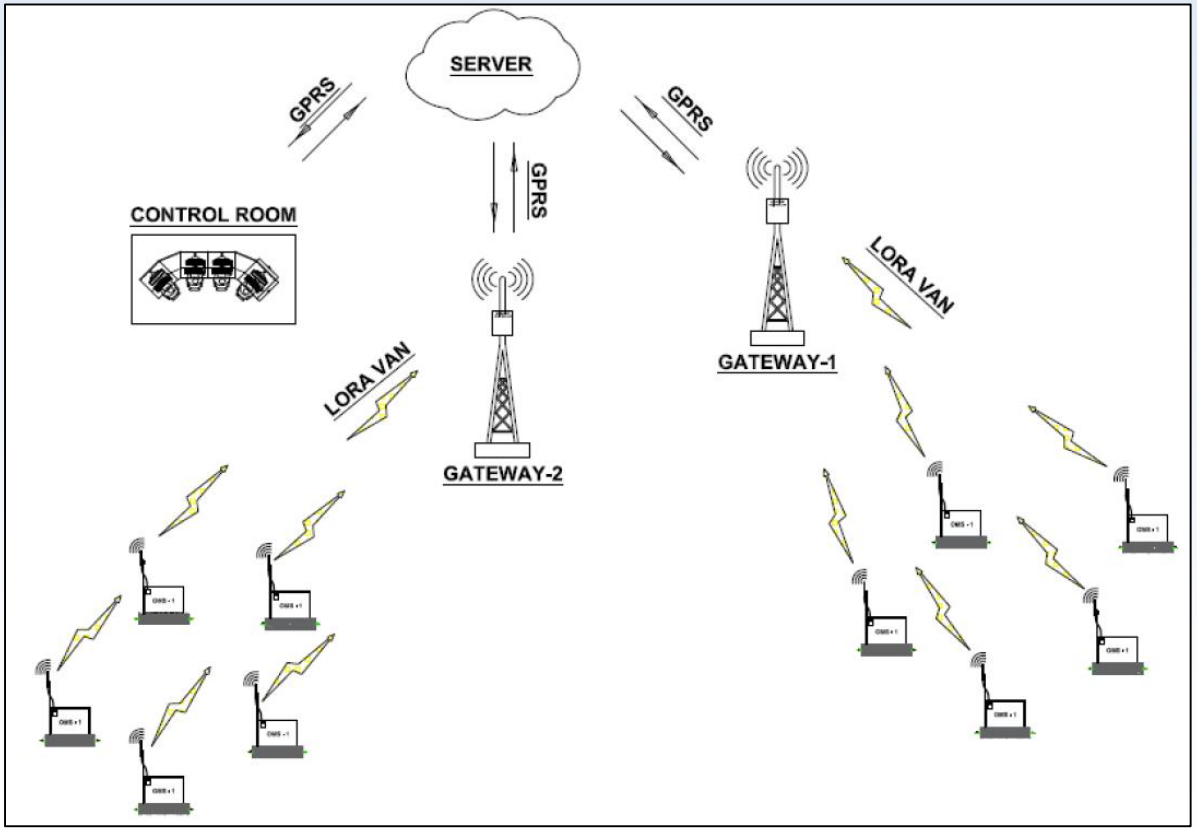
Typical Pump House Automation



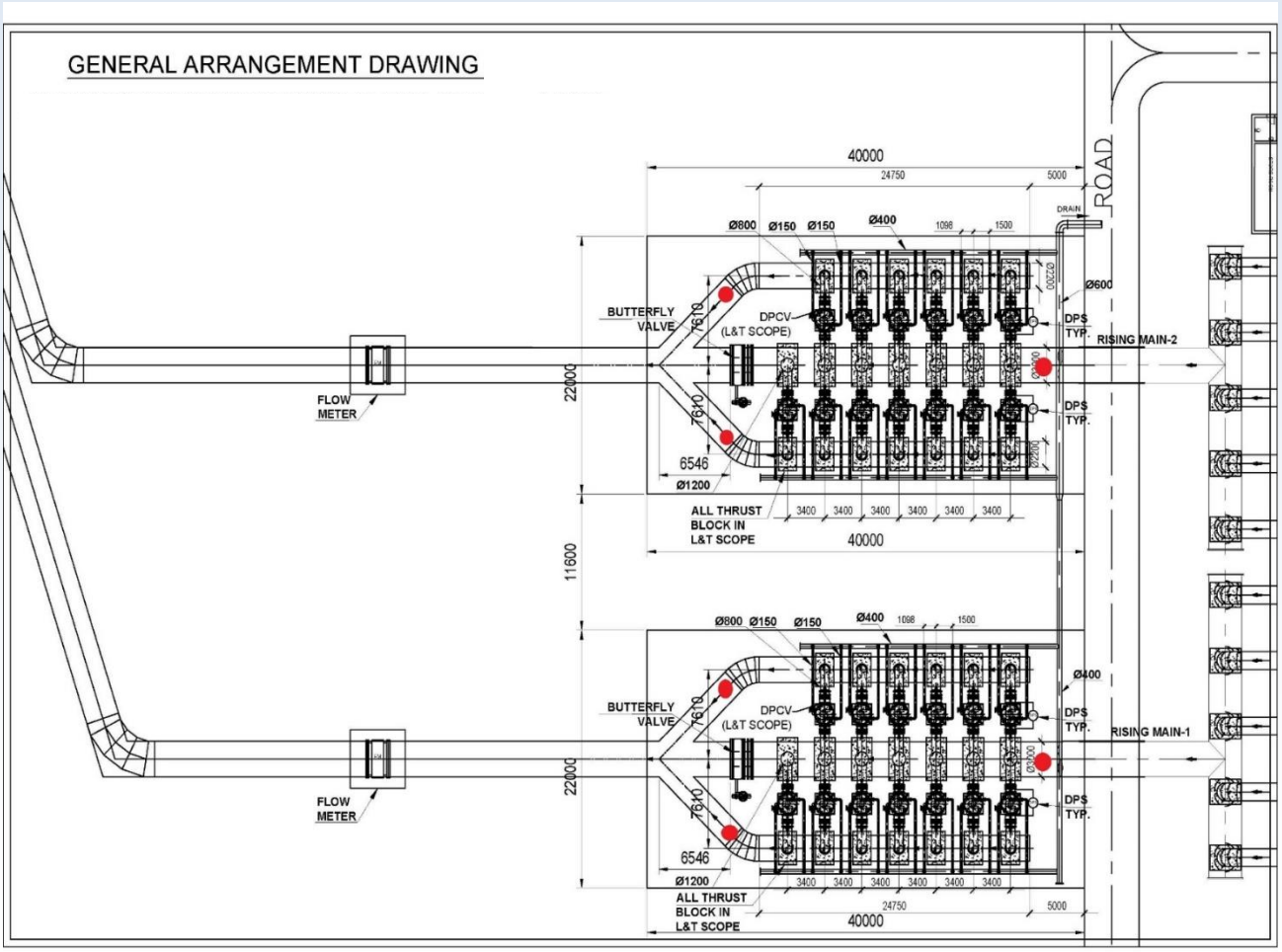
COMMUNICATION NETWORK BETWEEN OMS AND WEB-SERVER



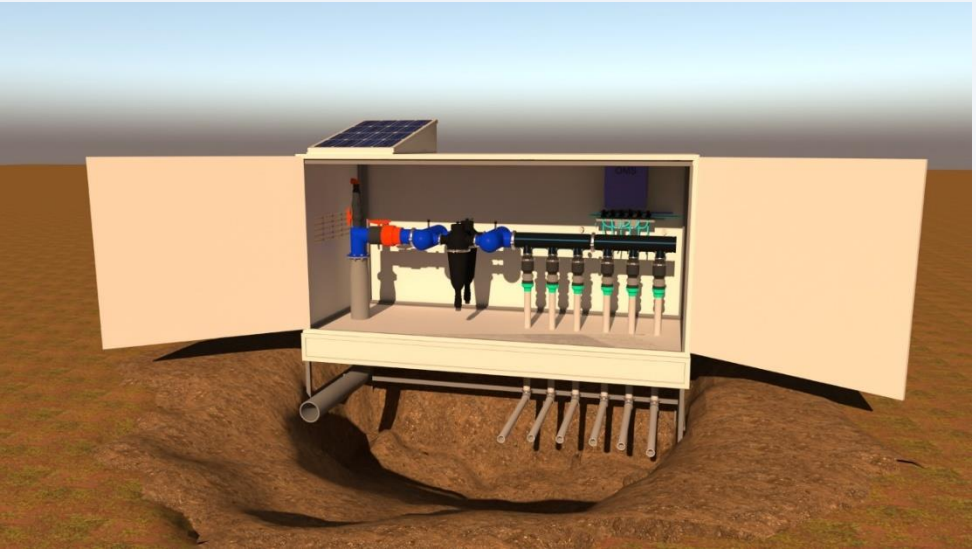
LoRaWAN Gateway



Primary Fully Auto Filtration System (200 Micron) at Main Pump House:



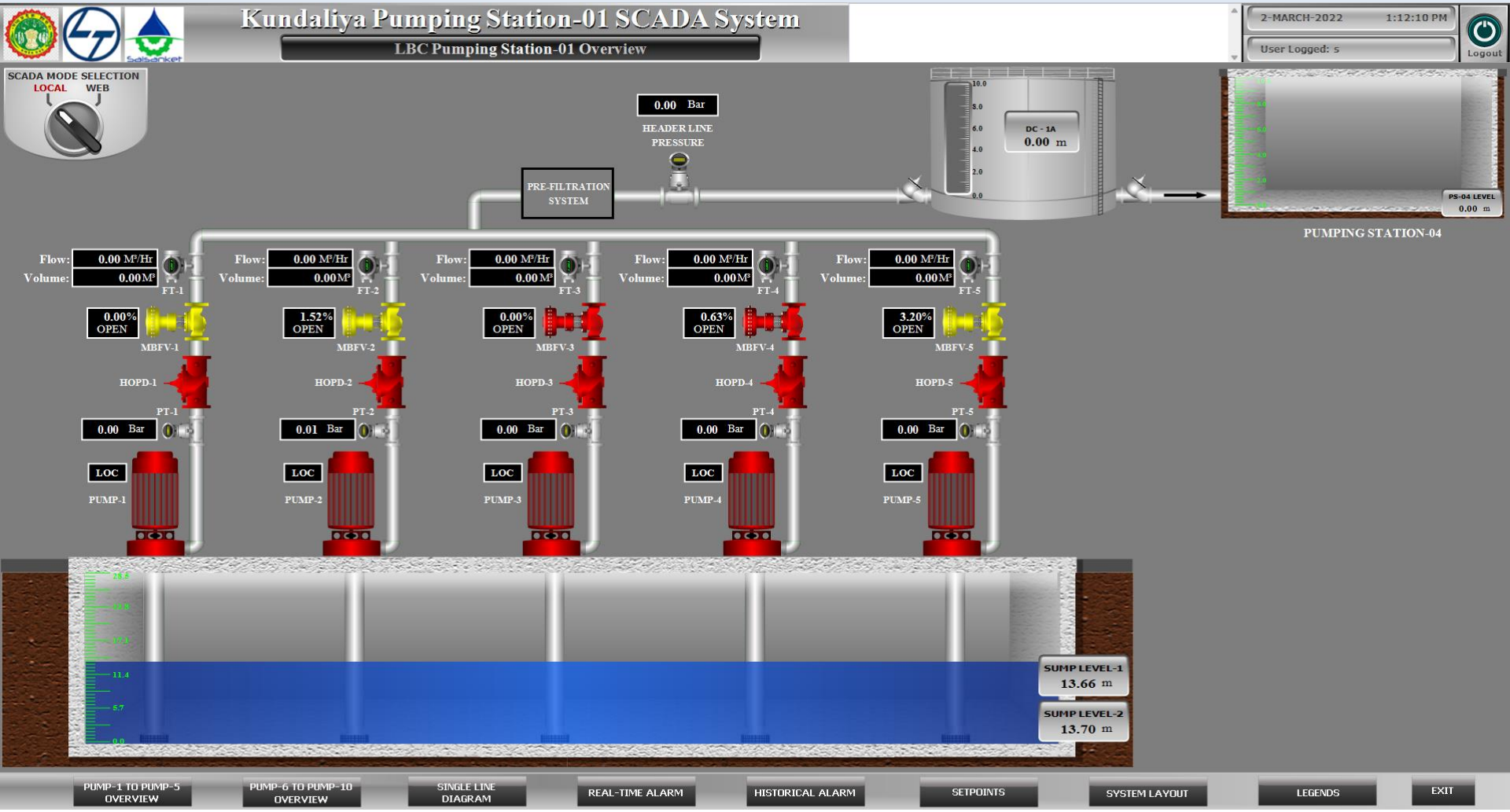
Semi- Automatic Secondary Filter (150 Micron) at each OMS Unit:



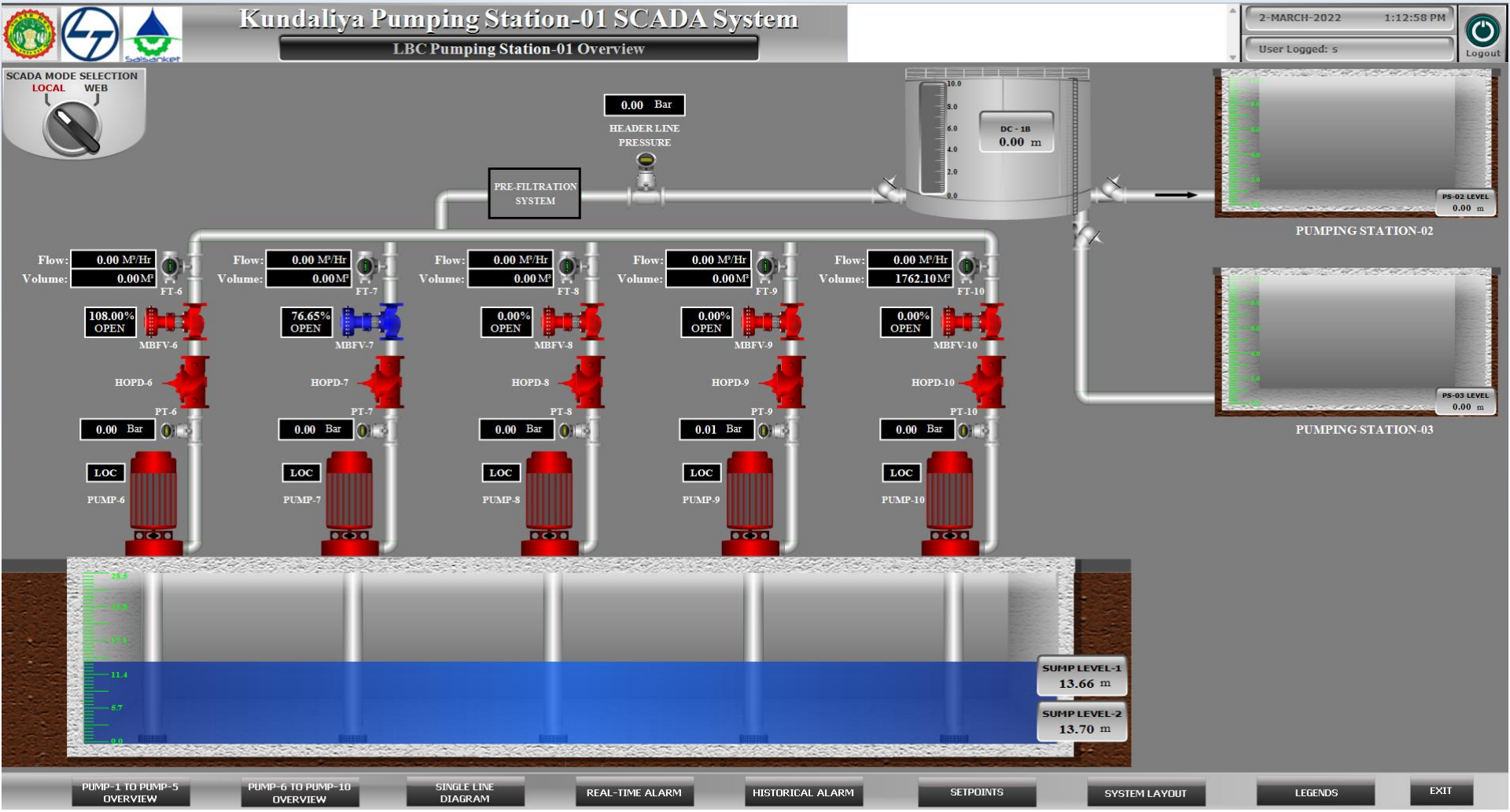
SCADA WORKING SCREEN AND TYPE OF REPORT AND ANALYSIS SCREEN

LOGIN SCREEN

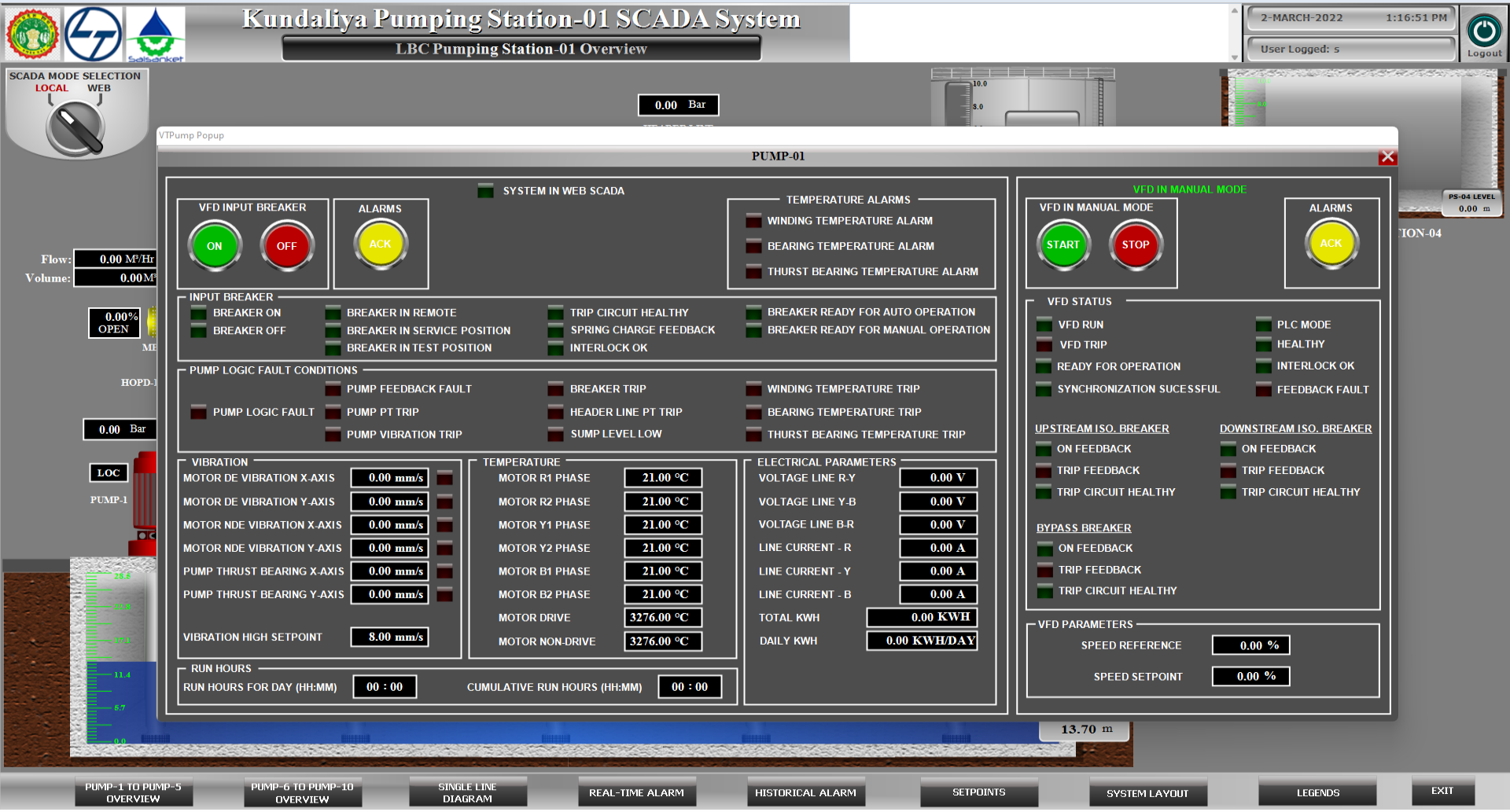
PUMPING STATION OVERVIEW



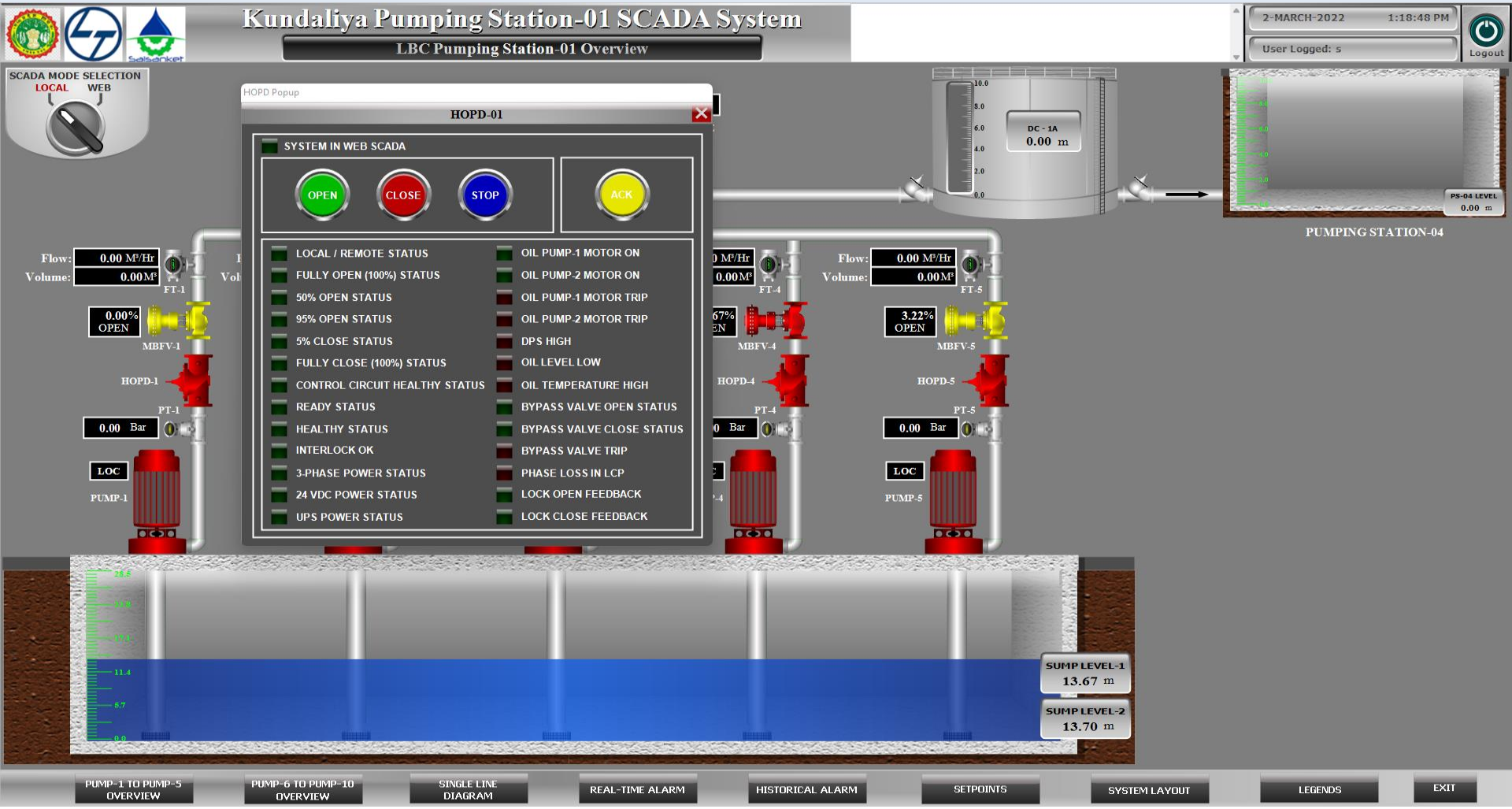
PUMPING STATION OVERVIEW



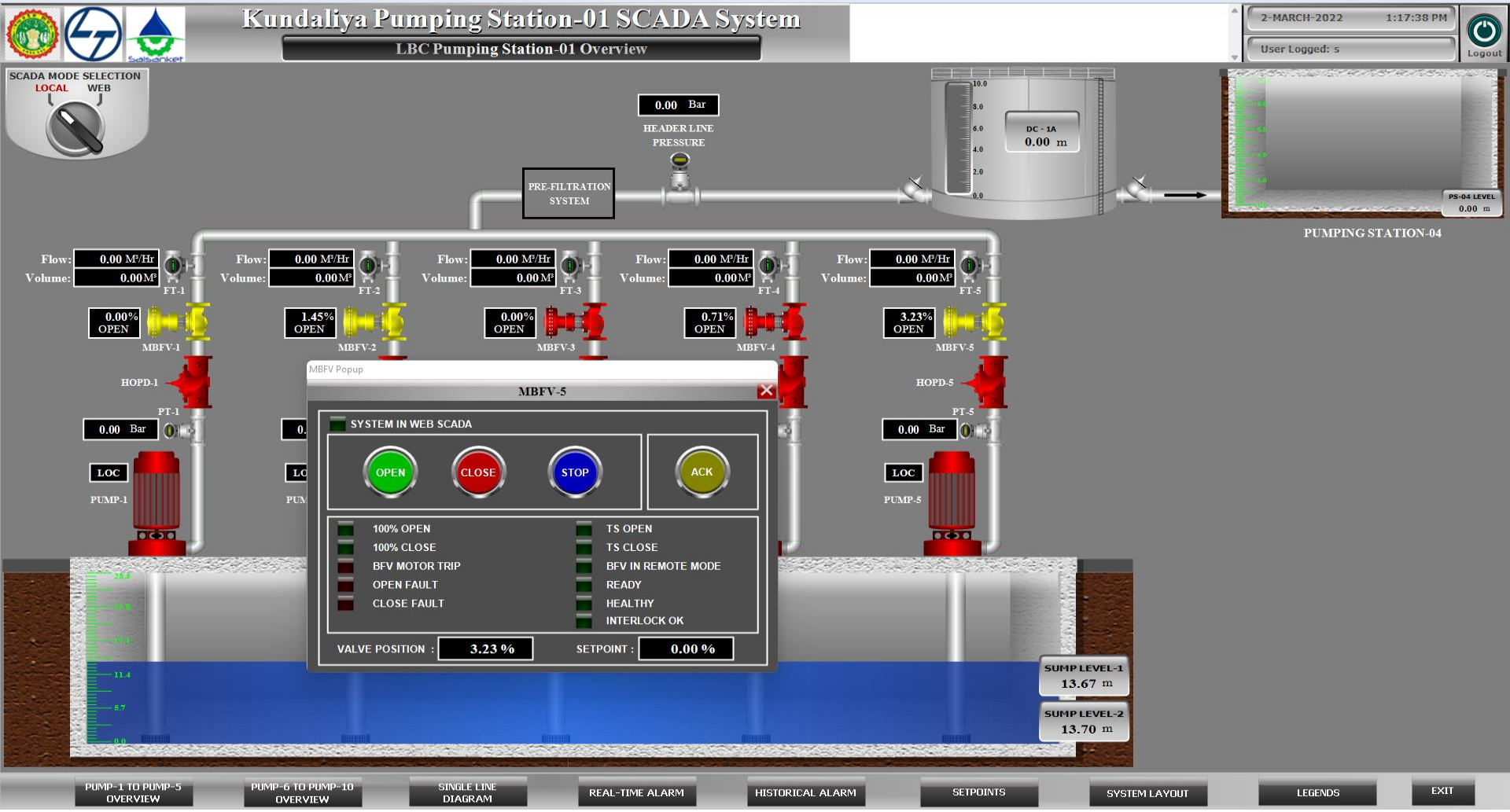
PUMPING STATION OVERVIEW - VFD



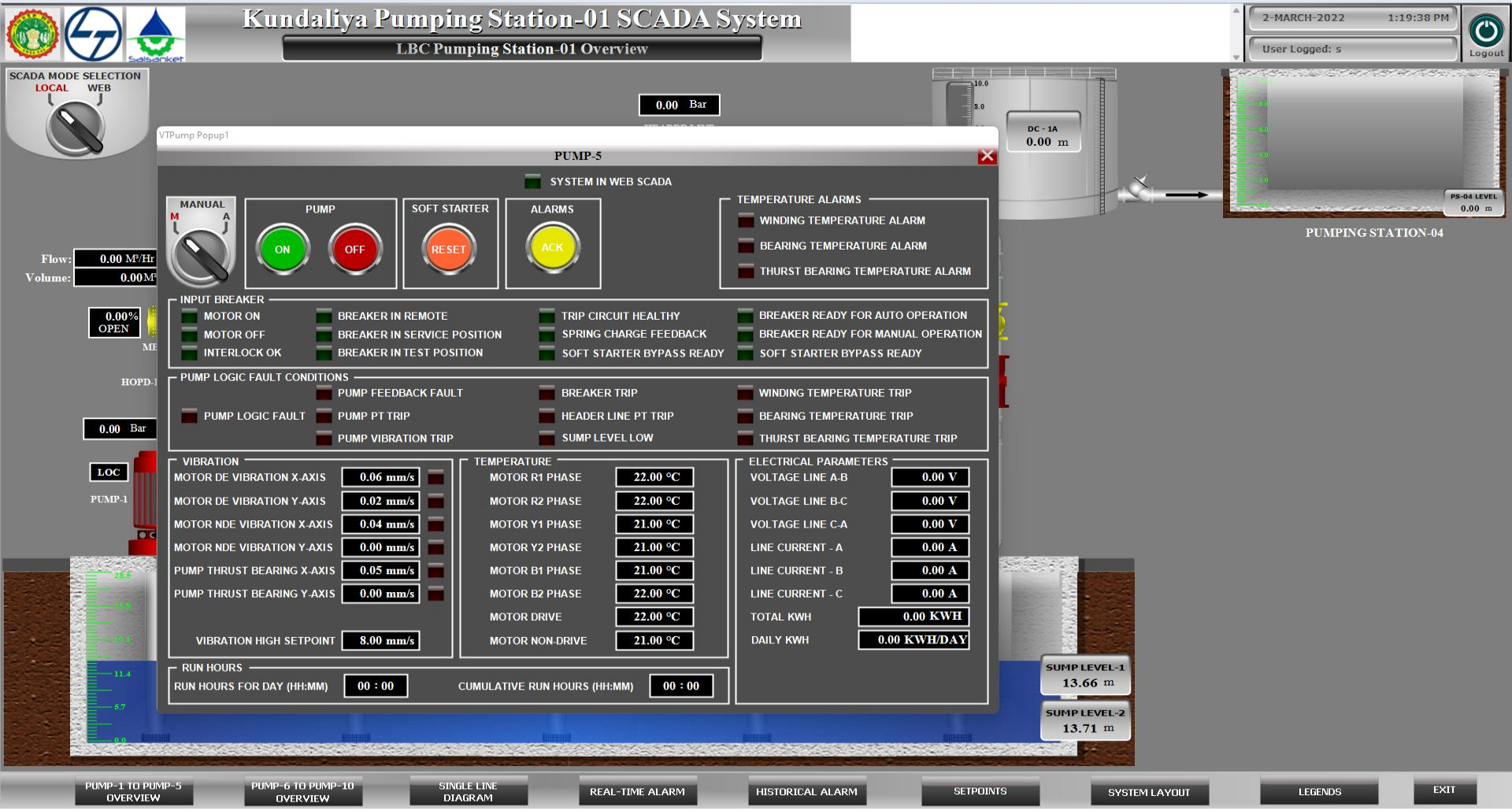
PUMPING STATION OVERVIEW – HOPD VALVE



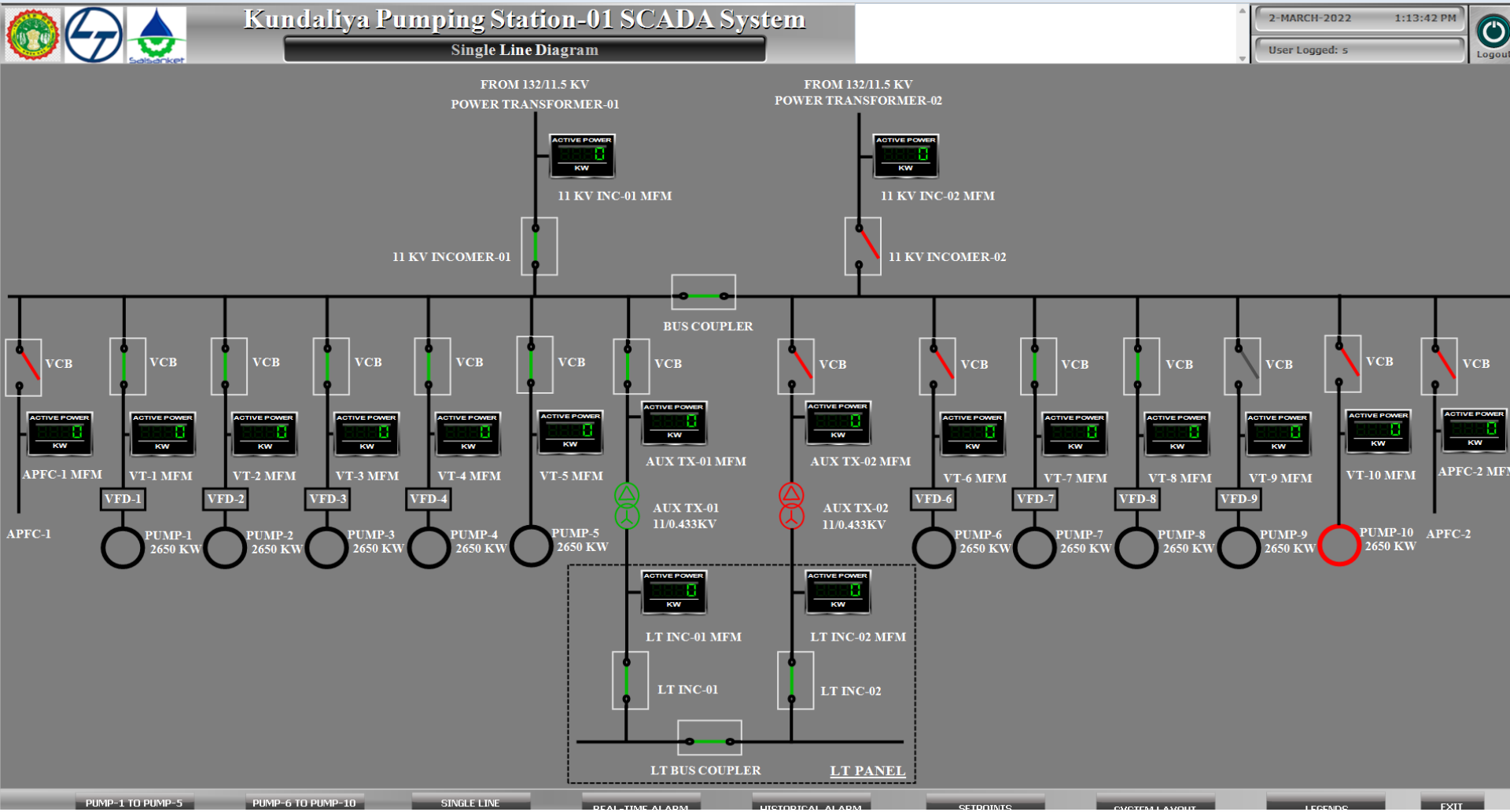
PUMPING STATION OVERVIEW – MBFV VALVE



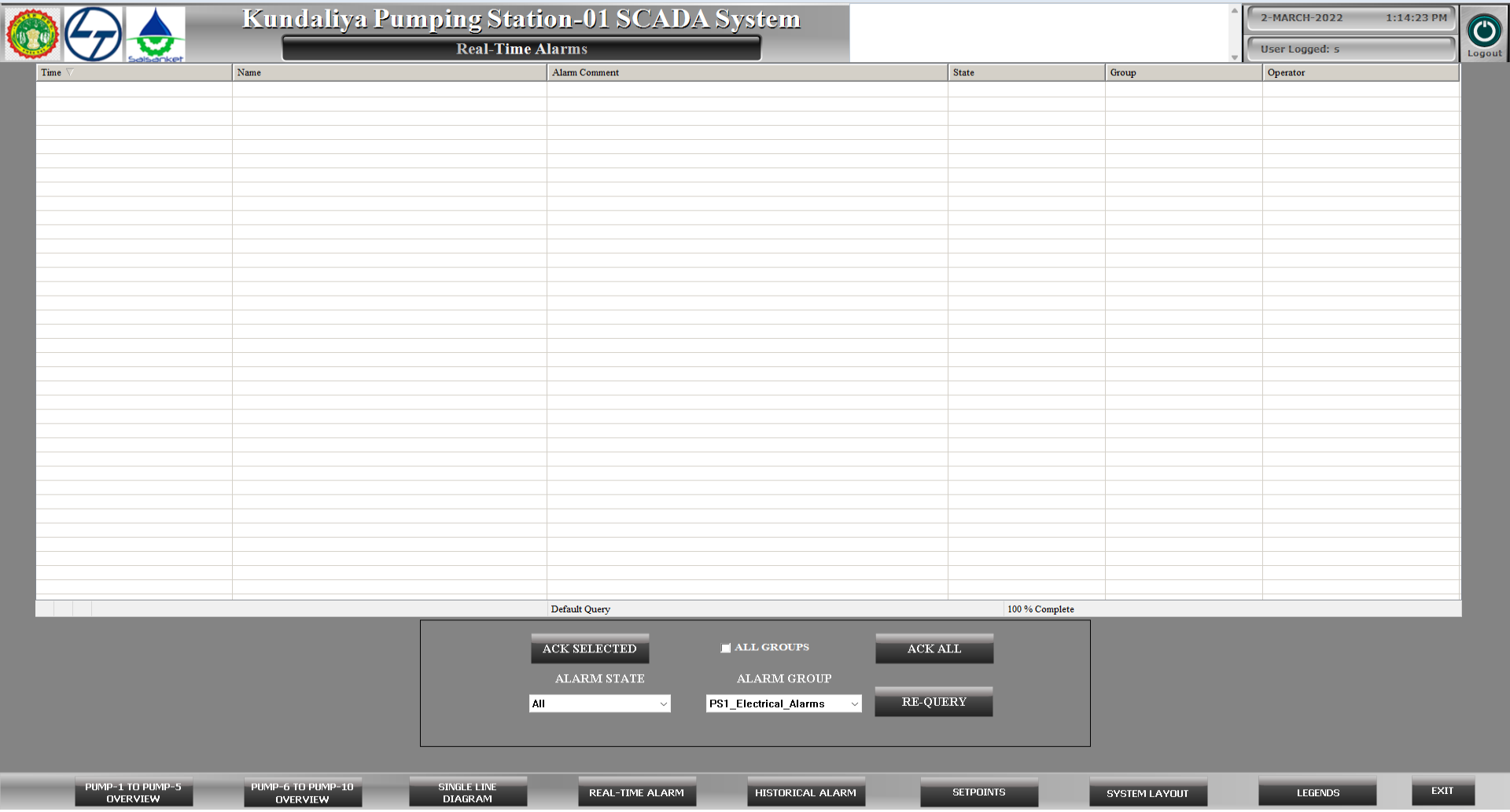
PUMPING STATION OVERVIEW – PUMP PARAMETERS



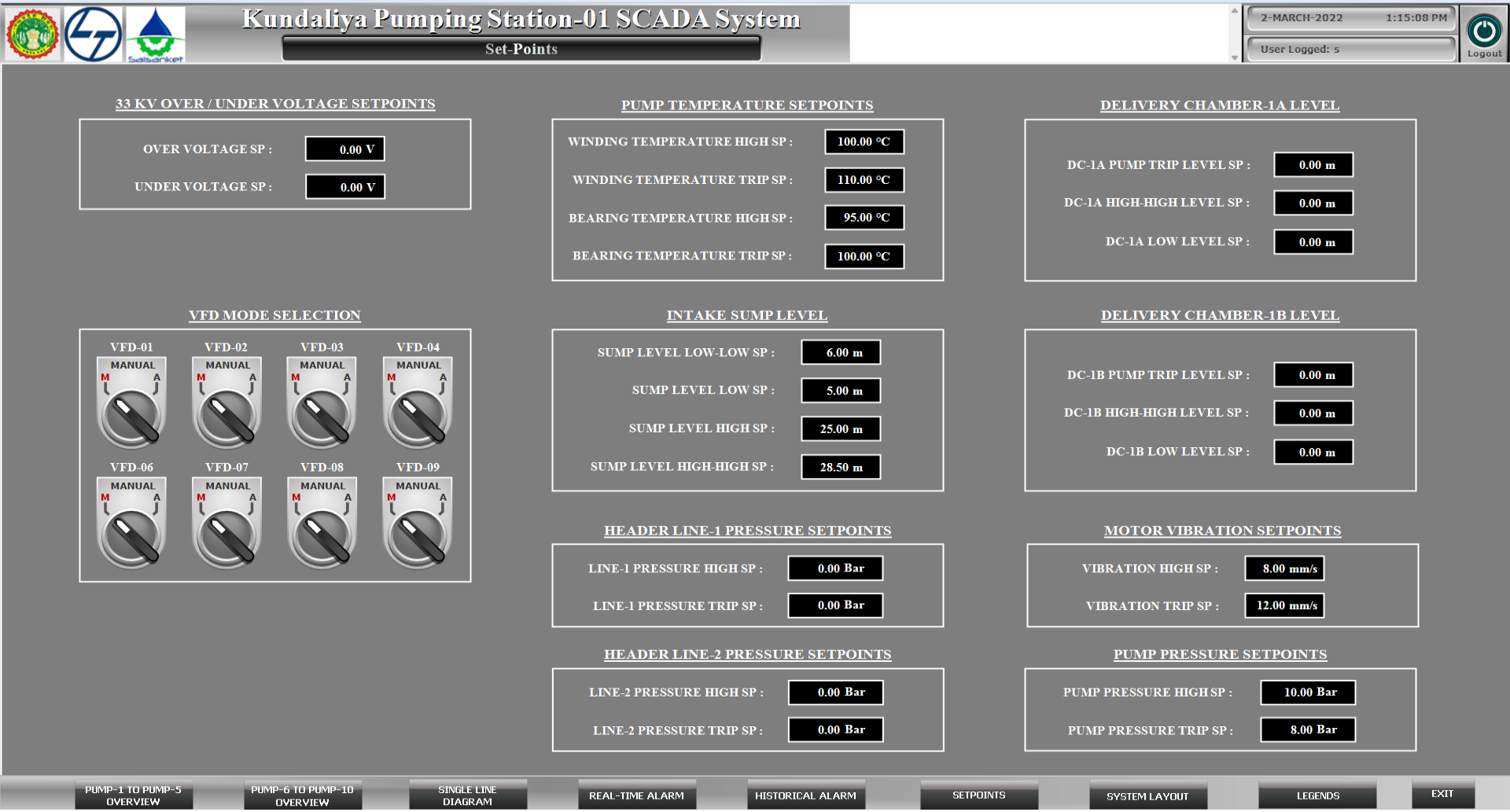
PUMPING STATION OVERVIEW – ELECTRICAL



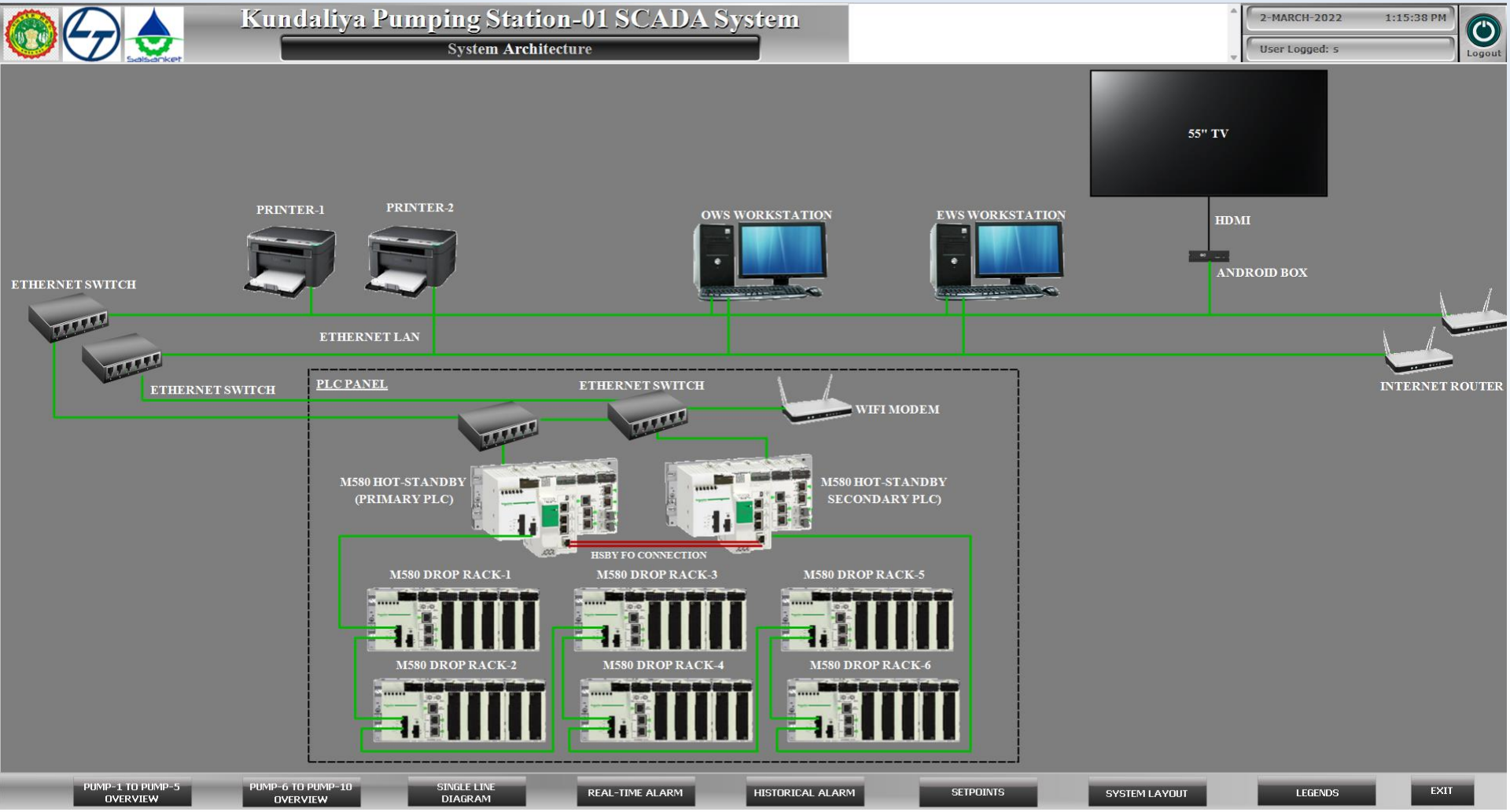
PUMPING STATION OVERVIEW – REAL TIME ALARM



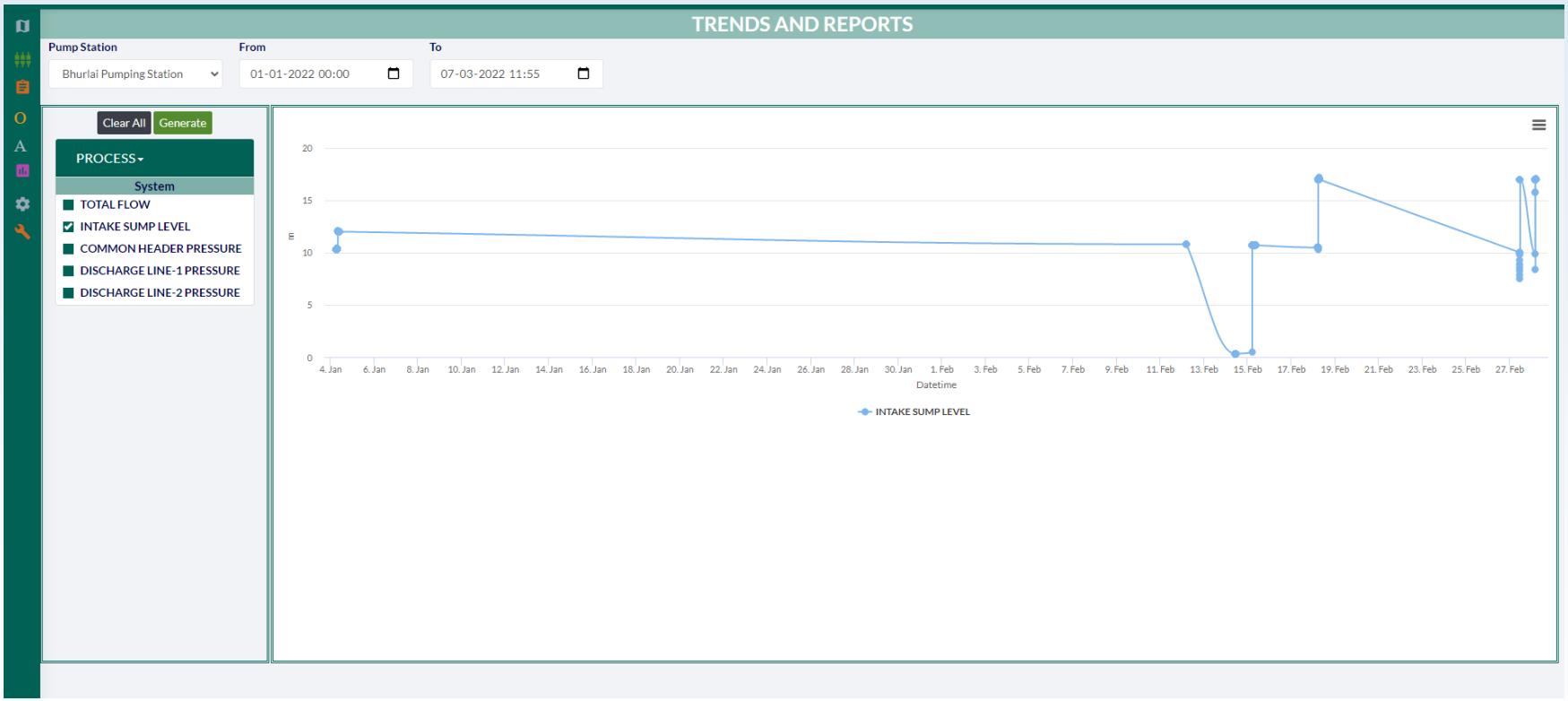
PUMPING STATION OVERVIEW – SET POINTS



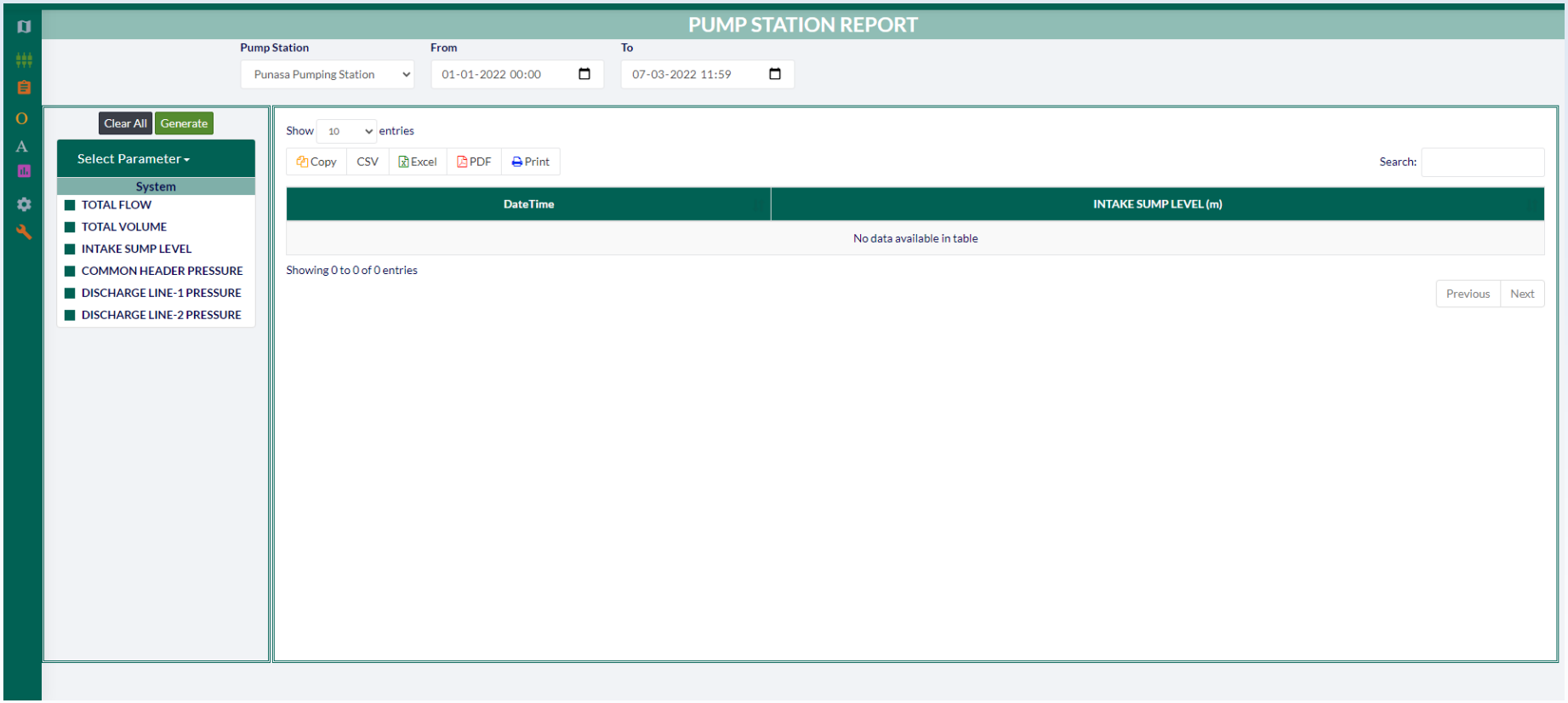
PUMPING STATION OVERVIEW – SYSTEM ARCHITECTURE



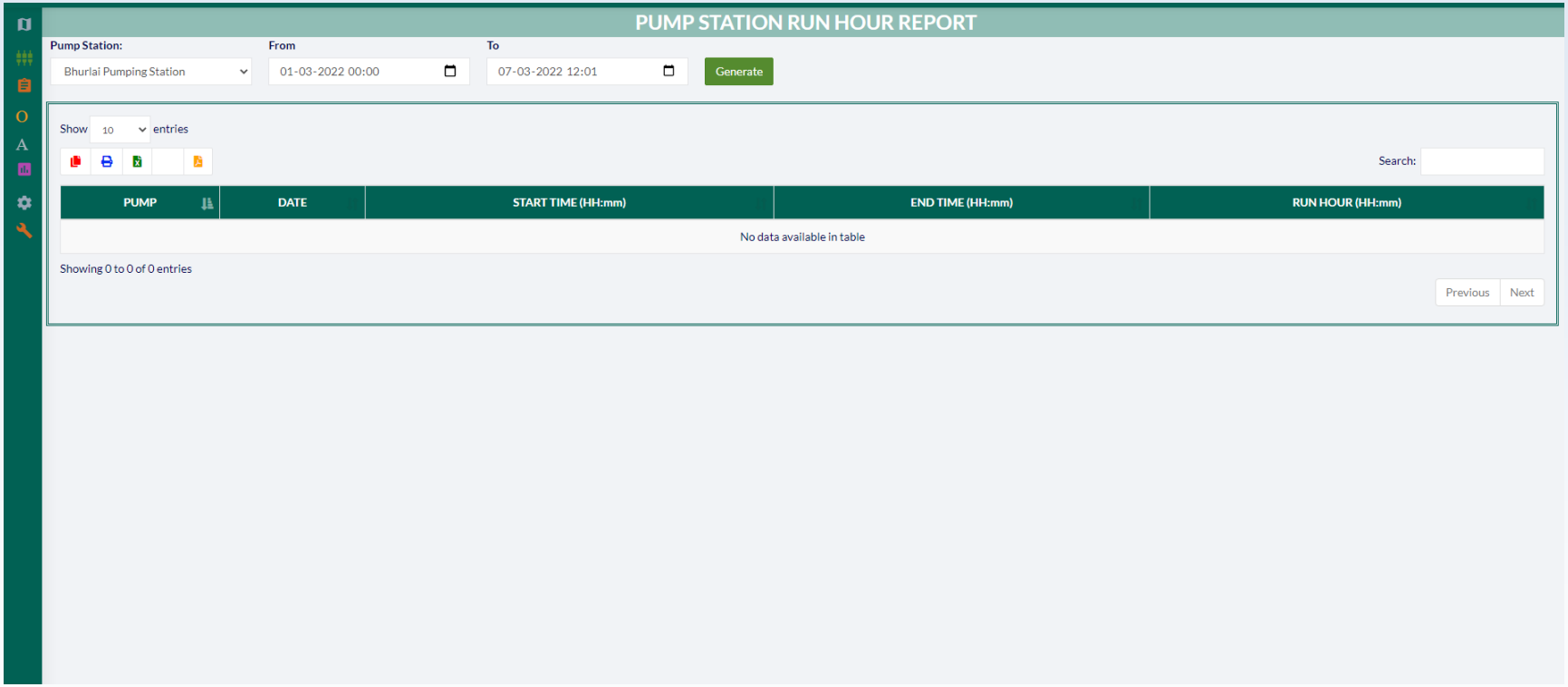
TRENDS AND REPORTS



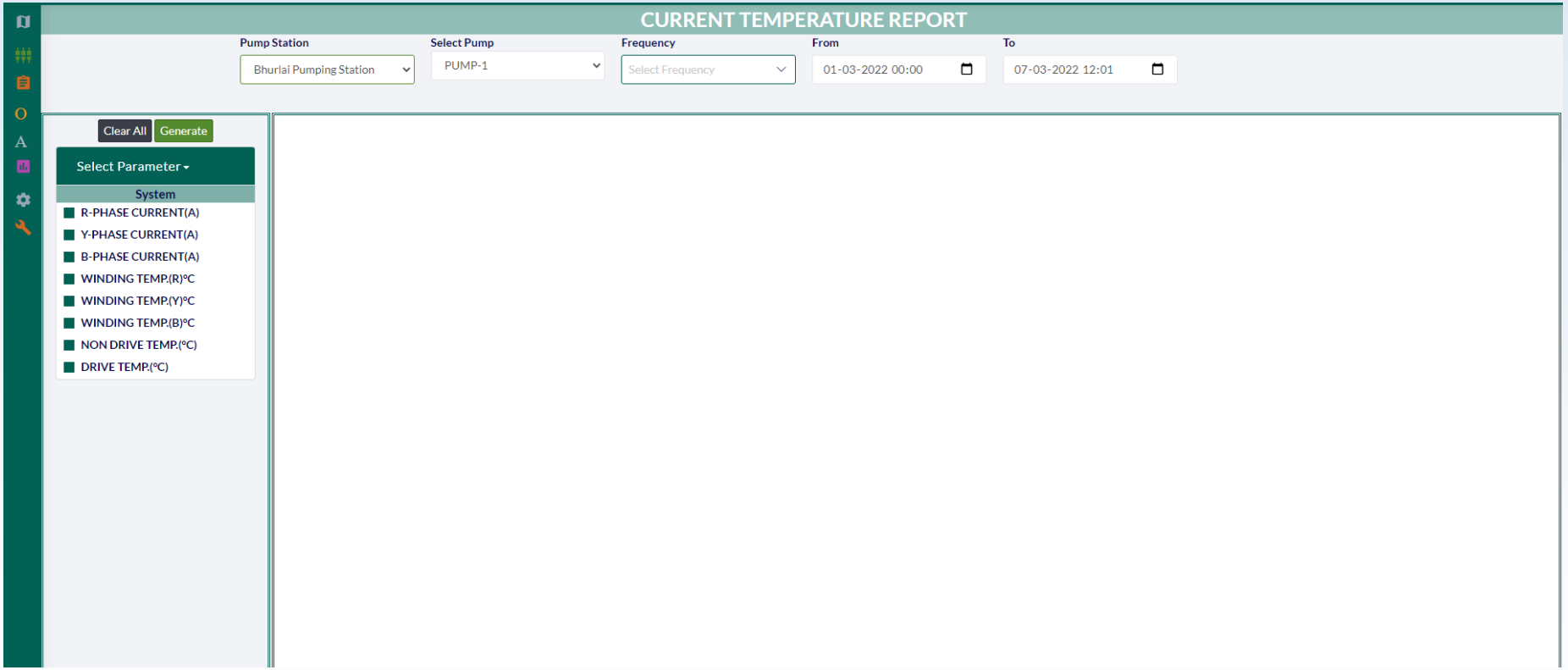
PUMP STATION REPORTS



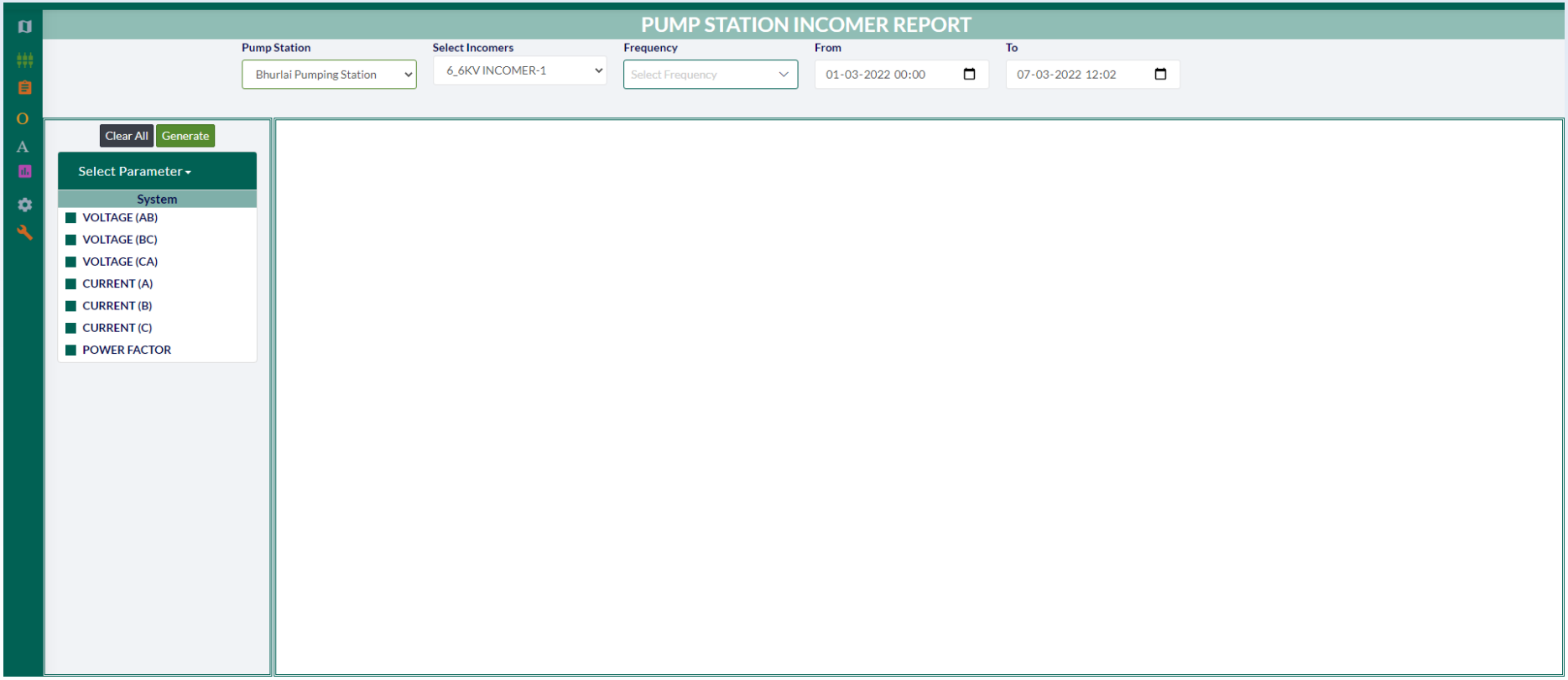
PUMP STATION RUN HOUR REPORTS



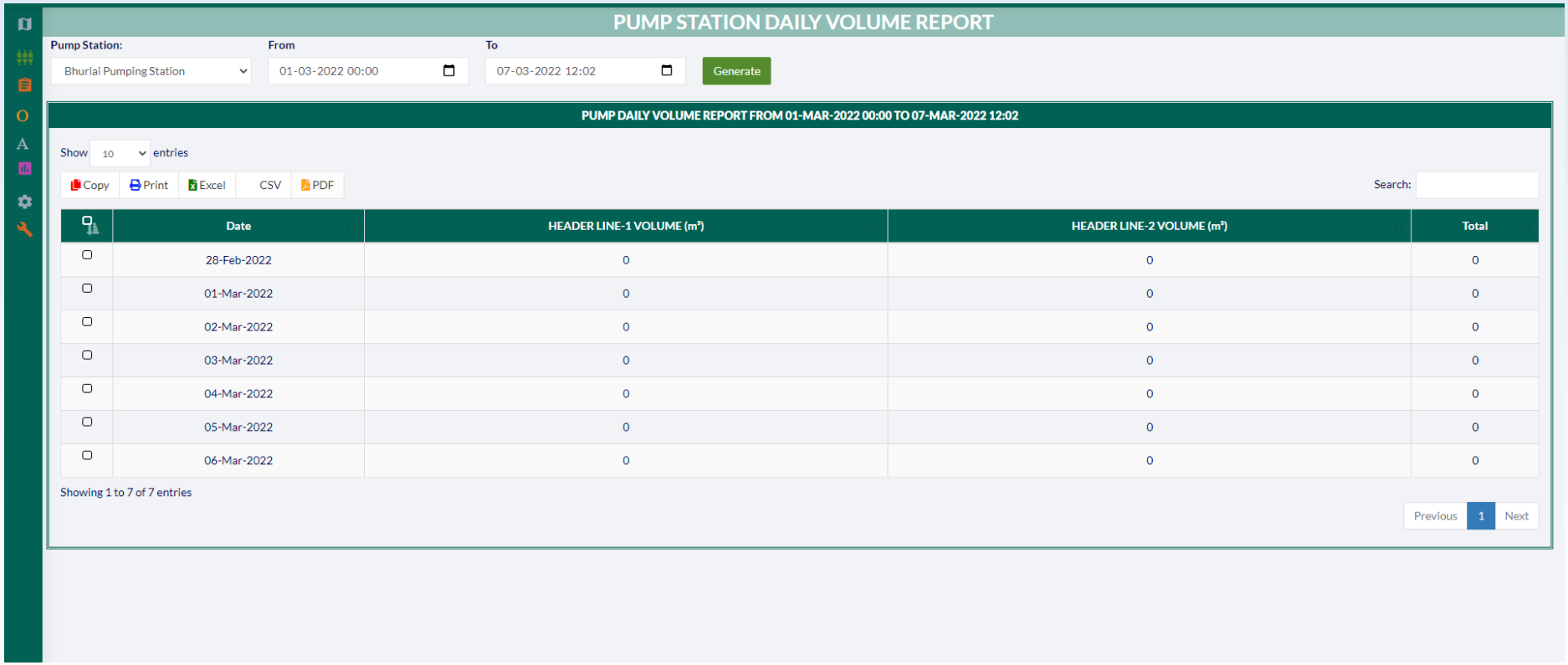
CURRENT TEMPERATURE REPORT



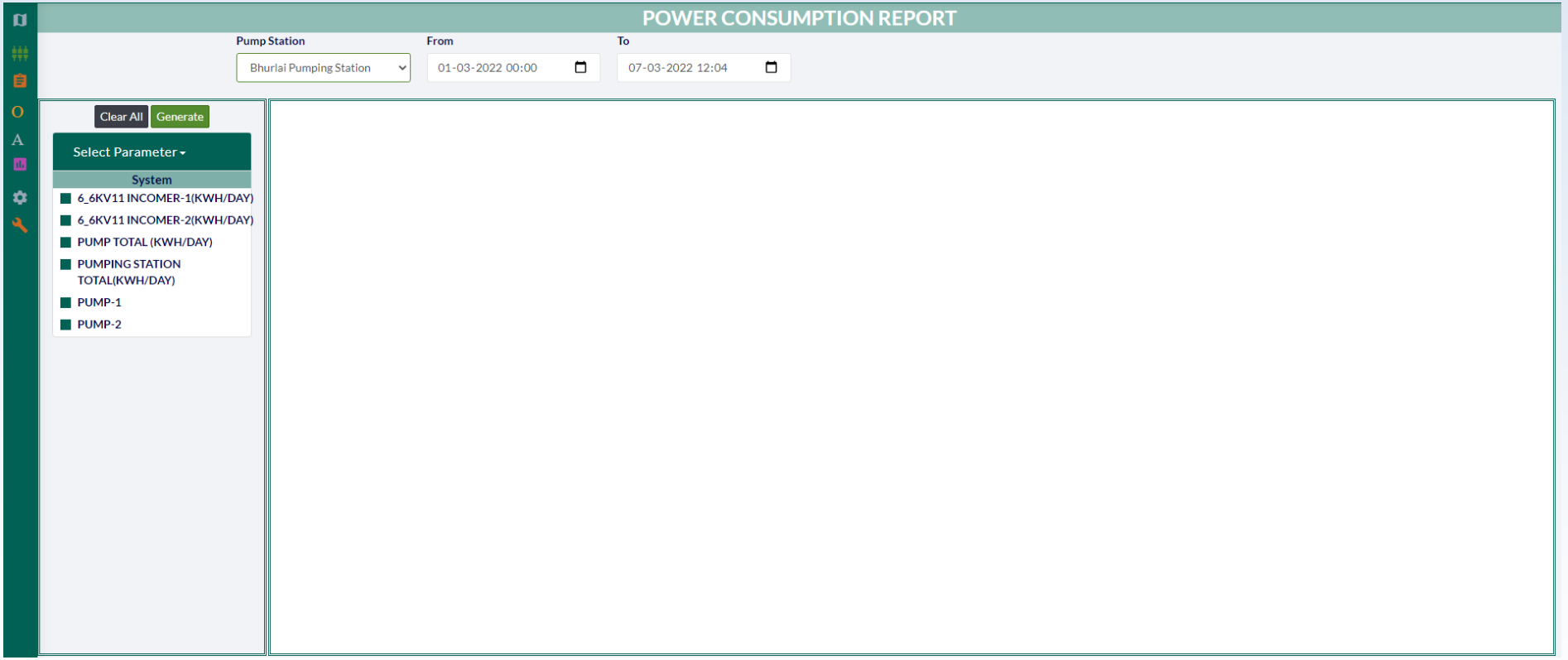
PUMP STATION INCOMER REPORT



PUMP STATION DAILY VOLUME REPORT



POWER CONSUMPTION REPORT

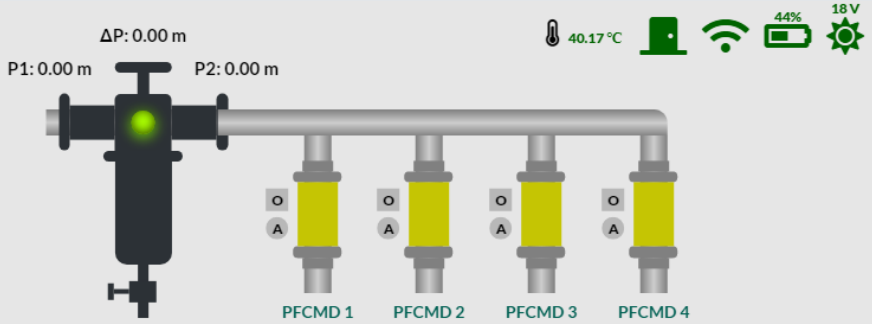


OMS - DETAILS

PUN_N12 (5246580000000285) 07-Mar-2022 10:49 ×

Area Name	PUNASA SCHEME	Network Name	RM/MINOR-7/OL-2/5310 m - N12
Design Pressure	28.50	Khasara Name	-
Chak Leader Name	Iswar Singh s/o Ramprasad	Chak Leader Number	9977652938
Village Name	FIFARI MAL	Chak Area (Ha)	17.66
Design Flow Rate (Lps)	6.29	Duty (Lps per Ha)	0.36

Interrogate | Refresh | Emergency Stop



Details | Static Info | Control Panel

Valve Details	PFCMD1	PFCMD2	PFCMD3	PFCMD4
Operation Mode	Open/Close	Open/Close	Open/Close	Open/Close
Auto/Manual	Auto	Auto	Auto	Auto
Valve Position (%)	36.36	36.36	24.46	59.85
Flow Rate (lps)	0.00	0.00	0.00	0.00
Today's Volume (m^3)	0	0	0	0
Pressure at Valve Discharge (m)	0.00	0.00	0.00	0.00
Head Reduction Across Valve (m)	0.00	0.00	0.00	0.00

OMS – STATIC INFO

PUN_N12 (5246580000000285) 07-Mar-2022 10:49 ×

Area Name	PUNASA SCHEME	Network Name	RM/MINOR-7/OL-2/5310 m - N12
Design Pressure	28.50	Khasara Name	-
Chak Leader Name	Iswar Singh s/o Ramprasad	Chak Leader Number	9977652938
Village Name	FIFARI MAL	Chak Area (Ha)	17.66
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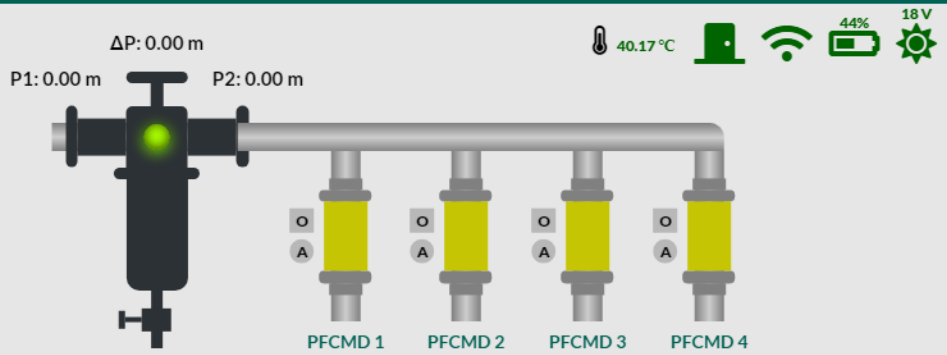
Interrogate | Refresh | Emergency Stop



Details | Static Info | Control Panel

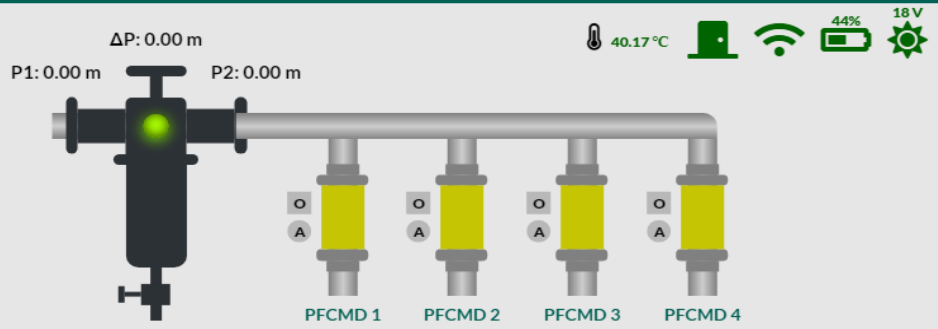
Sub-Chak Details	PFCMD1	PFCMD2	PFCMD3	PFCMD4
Group Leader Name	Iswar Singh s/o Ramprasad	Iswar Singh s/o Ramprasad	Iswar Singh s/o Ramprasad	Iswar Singh s/o Ramprasad
Group Leader Contact Number	9977652938	9977652938	9977652938	9977652938
Area under Sub Chak (Ha)	4.94	3.80	4.62	4.30
No of Manual Control Valves	8	8	8	8
Desired Flow at Sub-Chak	1.76	1.35	1.64	1.53

OMS – CONTROL PANEL

PUN_N12 (5246580000000285) 07-Mar-2022 10:49 ×

Area Name	PUNASA SCHEME	Network Name	RM/MINOR-7/OL-2/5310 m - N12
Design Pressure	28.50	Khasara Name	-
Chak Leader Name	Iswar Singh s/o Ramprasad	Chak Leader Number	9977652938
Village Name	FIFARI MAL	Chak Area (Ha)	17.66
Design Flow Rate (Lps)	6.29	Duty (Lps per Ha)	0.36

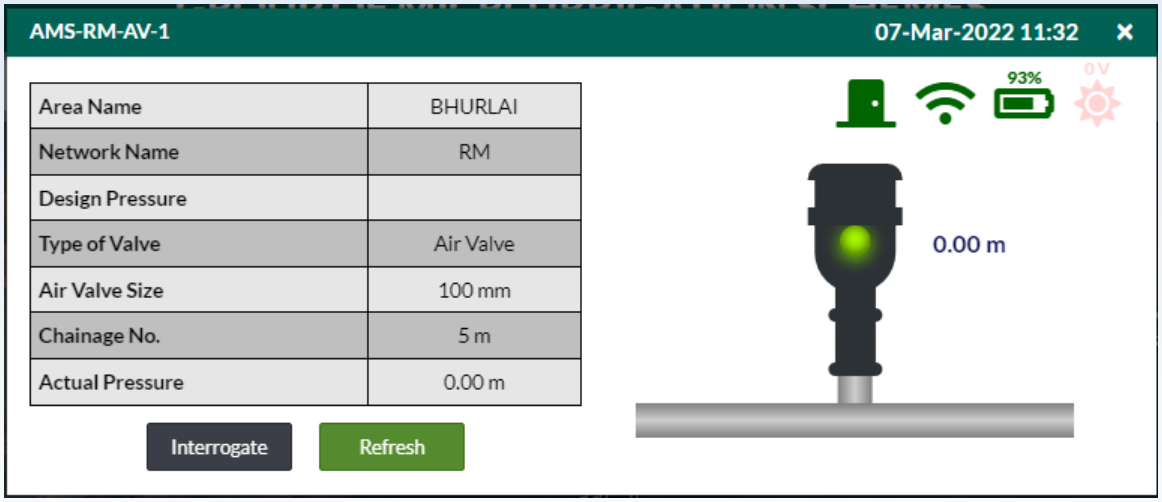
Interrogate | Refresh | Emergency Stop



Details | Static Info | Control Panel

Sub-Chak Mode Details	PFCMD1	PFCMD2	PFCMD3	PFCMD4
MODE SELECTION	Auto SET	Manual SET	Auto SET	Auto SET
Time Set Point (min)				
On/Off Command		Off		
OPERATION TYPE	Open/Close SET	Open/Close SET	Flow Control SET	Position Control SET
Sustaining Pressure (m)			0	
Reducing Pressure (m)			0	
Flow Set Point (lps)			0	
Position Set Point (%)				0
Open/Close	Open Close Both Off	Open Close Both Off	Open Close Both Off	Open Close Both Off

AMS


AMS-RM-AV-1
07-Mar-2022 11:32
Area Name
BHURLAI
Network Name
RM
Design Pressure
Type of Valve
Air Valve
Air Valve Size
100 mm
Chainage No.
5 m
Actual Pressure
0.00 m
Interrogate
Refresh
93%
0 V
0.00 m

OMS PREDICTIVE ANALYSIS REPORT

Area: All
Distributary: All
Report

NODE COMMUNICATION

Total OMS	Online OMS	Offline OMS
124	18	106

NODE ALARMS & EVENTS

Door Open	Low Battery	Low Solar	Filter Choked
9	95	124	0

PT Fail	Position Fail	High Temperature	Motion Detected
0	0	0	0

PFCMD1 ALARMS AND EVENTS

Low Flow	High Flow	No Flow
18	0	123

Low Pressure	High Pressure	In Irrigation	Volume Passed
0	0	0	1

On/Off Mode	Flow Control Mode	Position Control Mode	Other Mode
27	0	1	96

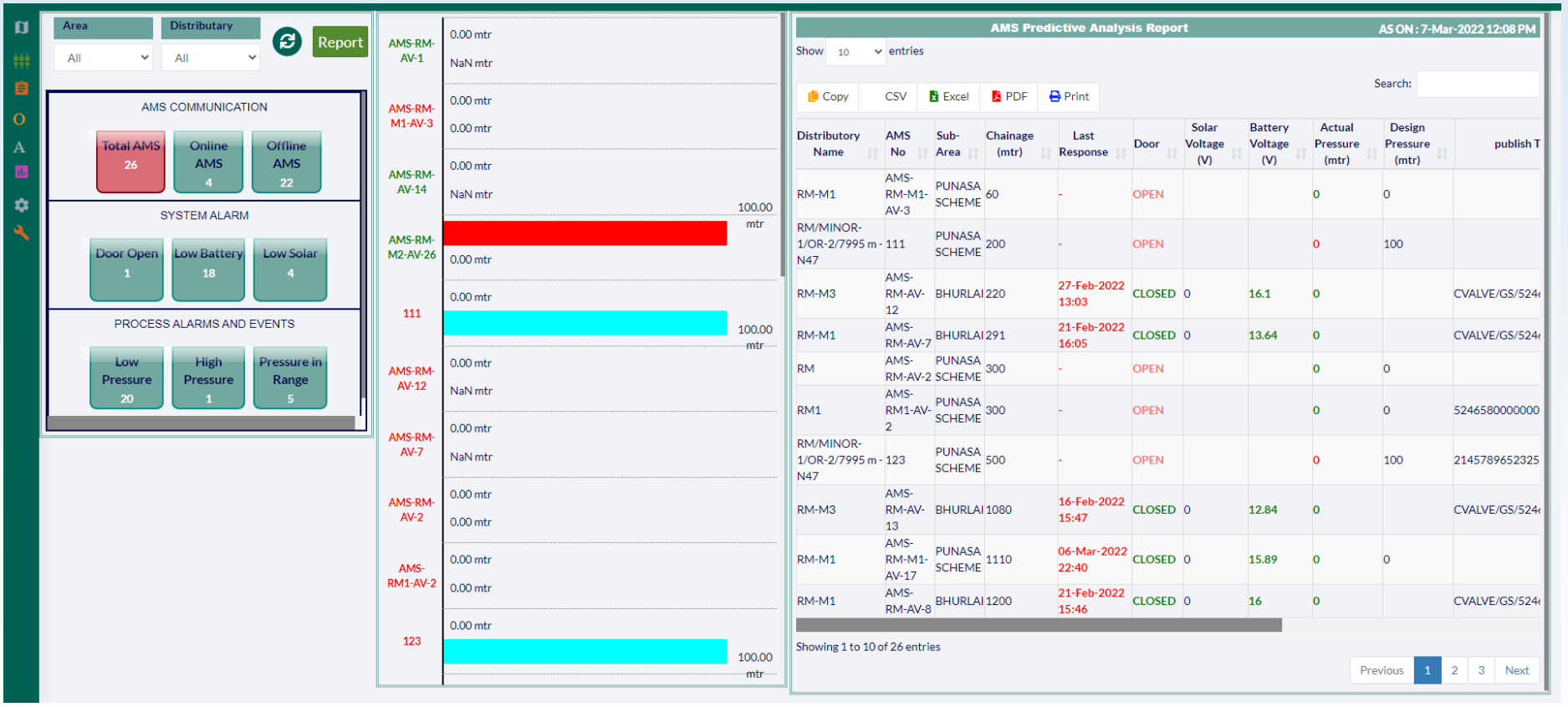
OMS Predictive Analysis Report — AS ON : 7-Mar-2022 12:06 PM

Show 10 entries — Copy | CSV | Excel | PDF | Print — Search:

Area	Distributary	OMS No.	Chak Area (Ha)	Last Response	Door	Solar Voltage (V)	Battery Voltage (V)	Filter Choked	High Temperature	Inlet Pressure V1(mtr)	Outlet Pressure V1(mtr)	Valve Position V1(%)	Design Flow Rate V1(lps)	Flow SetPoint V1(lps)	Flow Rate V1(lps)
BHURLAI	RM/OL-6/3510m - N13	BHU_N13	21.40	07-Mar-2022 12:02	OPEN	19.62	14.43	No	No	0.00	0.00	0	1.82	0.00	0.00
PUNASA SCHEME	RM/MINOR-1/LSM-3/OT/560 m - N60	PUN_N60_RM-M1-LSM3-OT	19.12	07-Mar-2022 12:00	CLOSED	17.45	13.47	No	No	0.00	0.00	0	1.79	0.00	0.00
PUNASA SCHEME	RM/MINOR-7/OL-2/5310 m - N12	PUN_N12	17.66	07-Mar-2022 11:50	CLOSED	17.33	13.44	No	No	0.00	0.00	35.22	1.73	0.00	0.00
PUNASA SCHEME	RM/MINOR-5/RSM-3/OT/205 m - N27	PUN_N27	18.98	07-Mar-2022 11:46	CLOSED	0	0	No	No	0.00	0.00	80.94	1.71	0.00	0.00
BHURLAI	RM/MINOR-8/OR-2/730m-N22	BHU_N22	21.11	07-Mar-2022 11:43	OPEN	0	0	No	No	0.00	0.00	0	1.80	0.00	0.00
PUNASA SCHEME	RM/MINOR-4/OT/2045 m - N33	PUN_N33	17.31	07-Mar-2022 11:41	CLOSED	17.33	13.65	No	No	0.00	0.00	61.76	1.64	0.00	0.00

Showing 1 to 10 of 124 entries

AMS PREDICTIVE ANALYSIS REPORT



AGRI SUPPORT AND CAPACITY BUILDING

Comprehensive Participatory Training Program – Photo Gallery





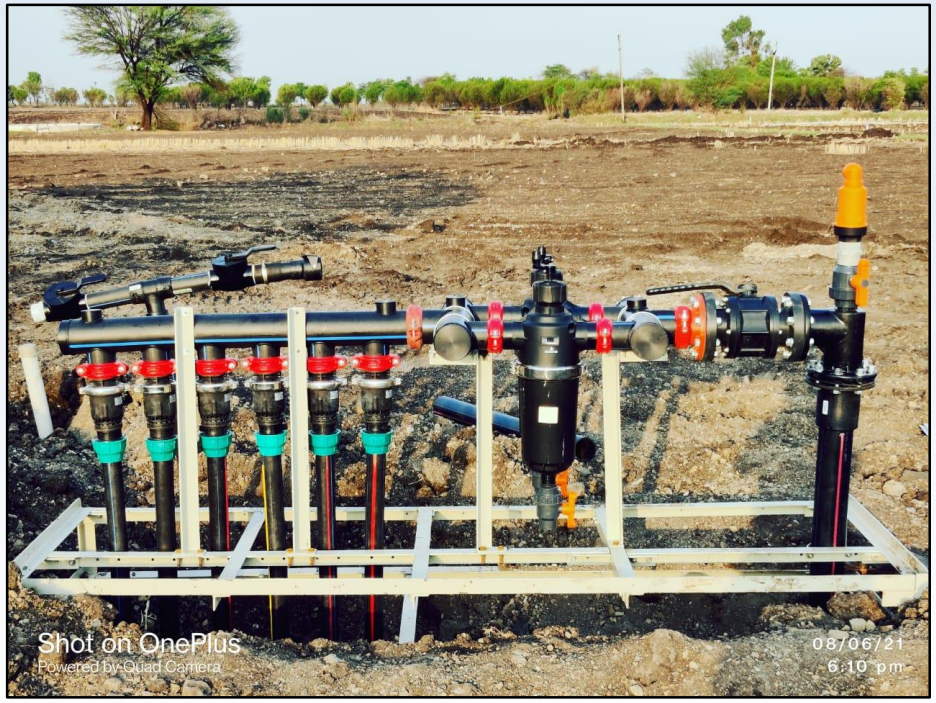
Comprehensive Participatory Training Program – Photo Gallery

IDENTIFICATION & TRAINING OF JAL MITRA/PRADHAN JAL MITRA

IDENTIFICATION & TRAINING OF JAL MITRA/PRADHAN JAL MITRA

FARMER FIELD SCHOOL

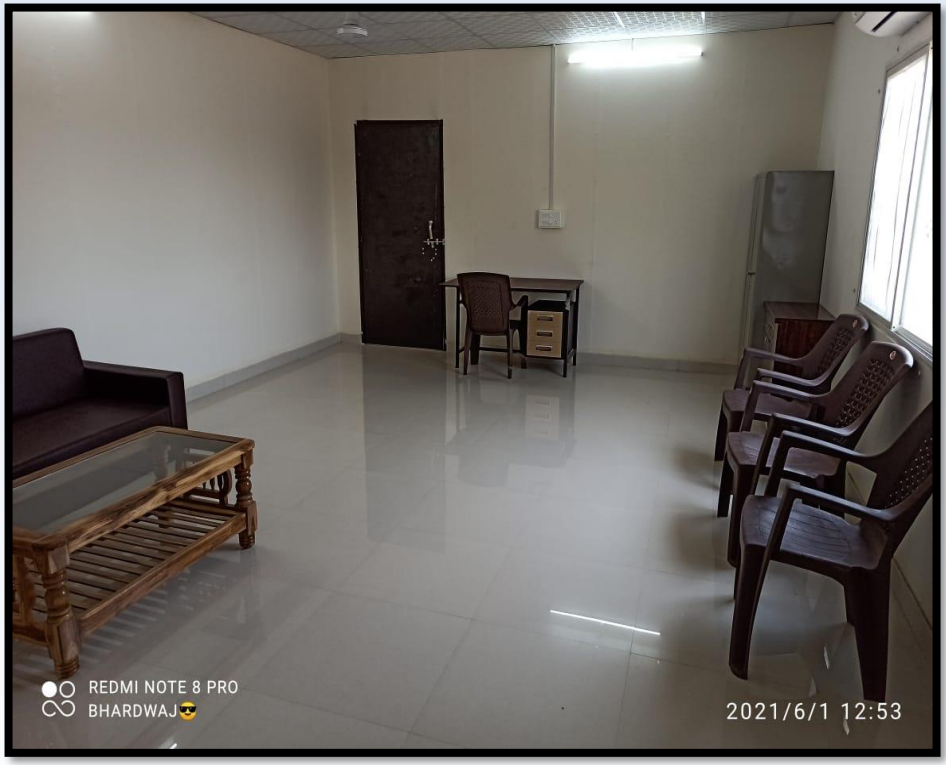
FARMER FIELD SCHOOL (FFS)



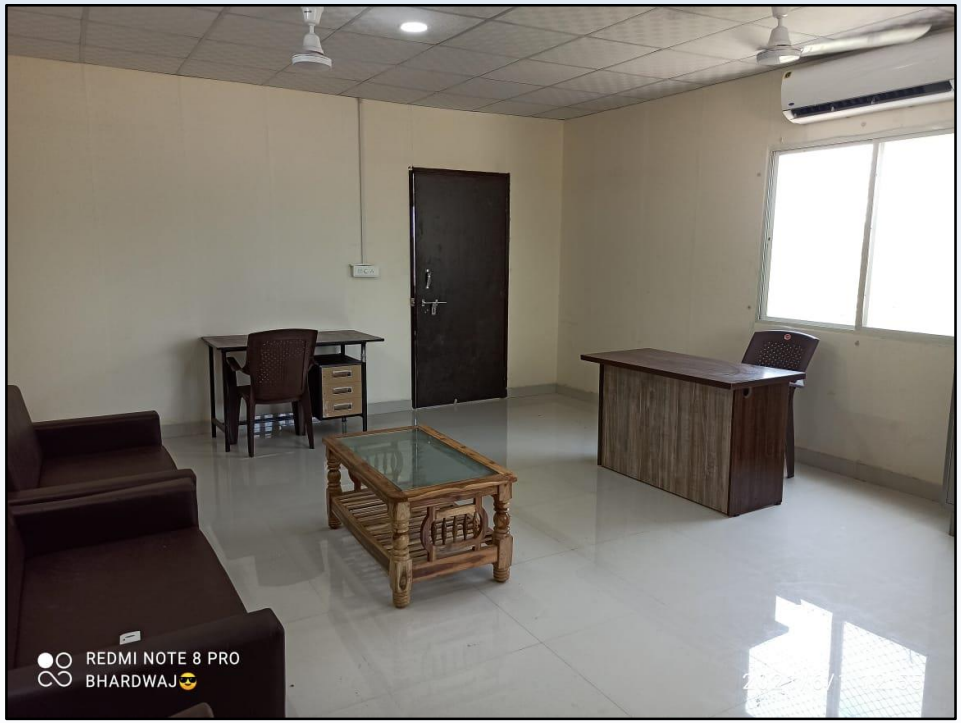
Pilwas FFS -
OMS

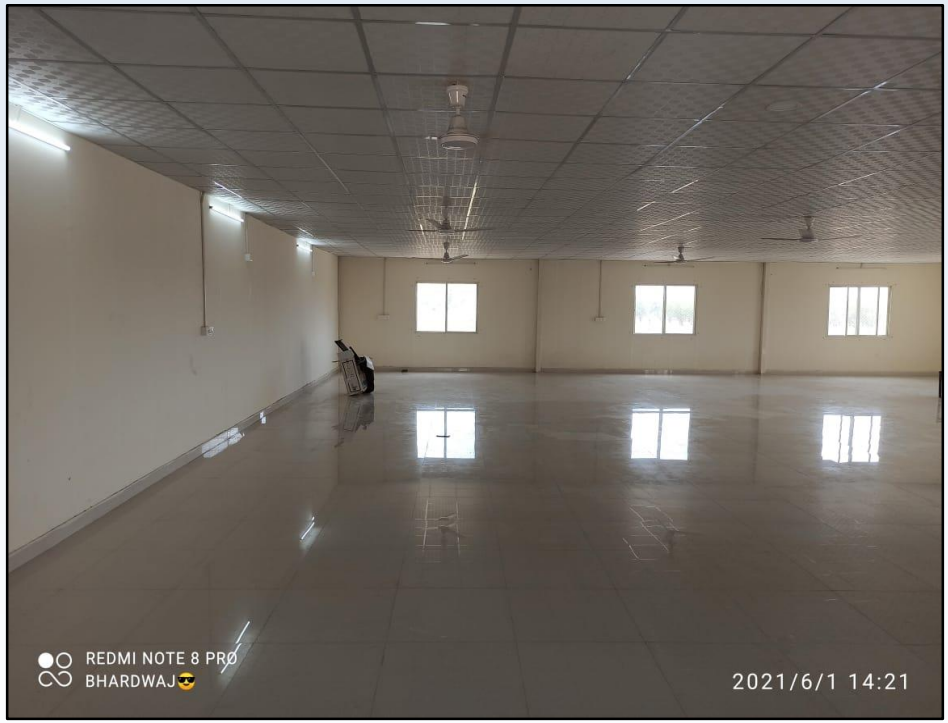
DRIP SYSTEM INSTALLED AT DEMO

Farmer Service Centre (FSC)



Farmer Service Centre





SOCIO-ECONOMIC SURVEY

RESOURCE TO ROOT

Water Source

Solar Base Distribution System

HDPE / PVC Pipe Network

Storage Tank & Automatic Filter Station

Outlets for Farmer

Micro Irrigation

More Crop per Drop

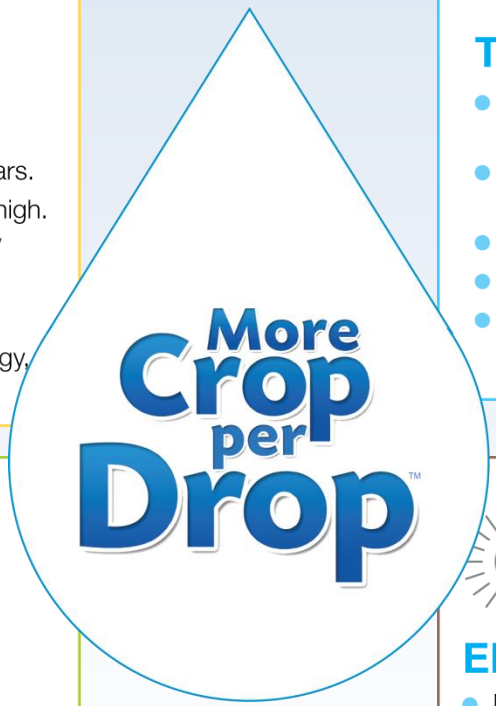
Benefits of Resource to Root

ECONOMIC

- Higher income for farmers.
- Pipeline network life 100+ Years.
- Water productivity is 5 times high.
- Farmers can take high value / cash crops.
- Results in sustainability.
- Concept ensures Water, Energy, & Food Security.

TECHNICAL

- Daily irrigation schedules are tailored as per crop requirements.
- Precise application of fertilizer & nutrient is feasible.
- Suitable for undulating terrains.
- Equitable distribution of water.
- Very high Water Use Efficiency up to 95%.



SOCIAL

- No land acquisition.
- No rehabilitation related issues.
- Social justice for all stakeholders.

ENVIRONMENTAL

- No water runoff & wastage.
- No leaching - No health hazard
- Maintains Soil Health.
- Saves Energy.
- Reduces GHG Emissions.
- Conserves natural resources.

Benefits of Resource to Root™

Sr	Mode of System	Overall Project Eff. %	Water productivity and value creation through Resource to Root concept	
			Cash crops	Food Grains
1	Open Canals + Flow Irrigation	34%	1.86 / 12.15	0.22 / 4.63
2	Up to Minor By Canal + Pipe Network + Flow Irrigation	40%	2.13 / 13.93	0.25 / 5.31
3	Up to Dy By Canal + Pipe Network + Flow Irrigation	46%	2.46 / 16.08	0.29 / 6.12
4	Up to Main Canal + Pipe Network + Flow Irrigation	53%	2.78 / 18.22	0.33 / 6.94
5	Complete Network Dam To Field Piped + Flow Irrigation	59%	3.22 / 21.08	0.38 / 8.03
6	Open Canals + Sprinkler Irrigation	42%	2.98 / 19.51	0.34 / 7.16
7	Up to Minor By Canal + Pipe Network + Sprinkler Irrigation	49%	3.48 / 22.76	0.40 / 8.35
8	Up to Dy By Canal + Pipe Network + Sprinkler Irrigation	56%	3.97 / 26.01	0.48 / 10.09
9	Up to Main Canal + Pipe Network + Sprinkler Irrigation	65%	4.61 / 30.19	0.53 / 11.08
10	Complete Network Dam To Field Piped + Sprinkler Irrigation	74%	5.25 / 34.37	0.60 / 12.62
11	Flow With Canals + Drip Irrigation	53%	4.64 / 30.37	0.52 / 10.82
12	Up to Minor By Canal + Pipe Network + Drip Irrigation	62%	5.48 / 35.84	0.62 / 12.77
13	Up to Dy By Canal + Pipe Network + Drip Irrigation	71%	6.31 / 41.03	0.71 / 14.72
14	Up to Main Canal + Pipe Network + Drip Irrigation	80%	7.15 / 46.77	0.81 / 16.67
15	Complete Network Dam To Field Piped + Drip Irrigation	90%	8.26 / 54.06	0.93 / 19.26

Water Productivity, kg/m³ Value Creation, Rs./m³

Note :

1. The Water Use and Yields of the cash crops is considered as average yield of Sugarcane, Banana, Cotton and Vegetables.
2. The Water Use and Yields of the food grains is considered as average yield of Groundnut, Pluses, Jawar, paddy, Wheat, Gram & Maize.
3. The average yields and MSP is taken from government of India websites. 30% and 70% increase in yield has been assumed in case of Sprinkler Irrigation and Drip Irrigation respectively.

Integrated Drip Irrigation is the Most Efficient Solution.

(Hypothetical Example from Cane Growing area in MS)

Sr .	Parameter	Model 1 - Traditional(20 ha)	Model 2- Piped Up to 4 ha level	Model 3 – JIIS
1	Conveyance By	Canal	Piped (Pressure)	Piped
2	Field Application By	Flow	Flow	Drip
3	Designed Area, Ha	10000	10000	10000
4	Overall Irrigation Efficiency, %	34	59	89
5	Water Use, Mm	228.48	131.67	87.28
6	Water Saving over Model 1, Mm^3	0.00	96.81	141.19
7	Capital Cost, Rs Crore	150	214.37	313.16
8	Energy Cost, Rs Crore (@ Rs 5/unit)	0	7.16	7.16
9	Total Yield, MT	495075	495075	933844
10	Gross Income, Rs crore	128	128	230
11	Cost of Cultivation, Rs Crore	85	85	85
12	Water Use Efficiency, Kg/m^3	2.17	3.76	10.70
13	Water Productivity, Rs/m^3	5.6	9.7	26.3
14	BC Ratio	1.27	1.15	1.92
15	IRR, %	21%	10%	49%
16	Payback Period, Years	6-8	10-12	4-5

Note: In Model 2, monitory value of water saving is not considered

Video Link of Project:

Must See this revolutionary project planning and effect after execution of project

Just Search on YouTube with below name:

Mohanpura Project Documentary Hindi Render

https://youtu.be/2fnJkuomP-Q

Ramthal - World's largest Integrated Drip Irrigation Project

https://youtu.be/6-QC2yX306A

Why Government Should Take Interest?

- Efficient use of limited water resources through efficient system operation
- Increase in irrigated area with water saved from adoption of MIS
- Saving on electrifications costs
- Saving on energy consumption in agriculture
- Employment generation as an offshoot of increased agricultural productivity
- Feasibility of adopting volumetric basis for water charges
- Ground water depletion can be arrested.
- Fewer environmental problems, such as water logging and salinity.
- To Improve economic well-being of the farming community in Irrigated areas
- For Higher GDP (Gross Domestic Produce) especially from Agriculture and more “inclusive” growth

Total Area (Ha)	Individual Farmer Land (Ha)	Total No. of Farmers (No's)	Pump HP Required for each Farmer if he has water source (HP)	Total Pump HP for Total Area (HP)		As per IIS Concept- For 10000Ha Project required pump HP
10000 Ha	2 Ha	5000 No’s	5 HP	25000 HP		4000 - 5000 HP

Why Farmers Should Take Interest?

- Higher farm productivity and higher farm incomes
- Improved Reliability of Water availability
- Increase in Irrigation intensity and cropping intensity

Attentive actions needed for implementation of IIS

- Preparation of farmers list and formation of groups
- Provision of additional budget required for adoption of MIS
- Co-operative/ Cropping patterns – Proper planning
- Crop rotations (Time of sowing / Harvesting)
- Irrigation and fertigation Scheduling
- Time table of cultivation practices
- Hydraulic design of the project and its implementation
- Synchronization of the hydraulic components
- Possibility of single feeder electrical supply
- Land acquisitions for sump wells (Very Less)
- Approach roads for pumping stations
- Social awareness

Implementing Criteria for IIS

- Agreements from involved farmers and formation of co- operative lift irrigation schemes
- Survey of individual field and collection of required data (Climate, Rainfall, Humidity, existing electricity network, existing storages/pipelines, Soil and Water sample and its analysis etc.)
- Selection of cropping pattern on basis of soil and water analysis report, existing market, technical guidance etc.
- Proper selection of technically sound implementing agency who can design the suitable system as per the site specific requirements
- Proper planning for sump wells, pump house, administrative office, roads etc.

Contd…

- Proper planning for collection of water charges, electricity charges.
- Proper planning for operation schedule of the system.
- Awareness campaigning/ trainings to the farmers for system maintenance, fertigation and technical guidance.
- Provision of maintenance of the scheme in a proper way.

Observations out of long years of Experience in promoting efficient Irrigation Practices in India

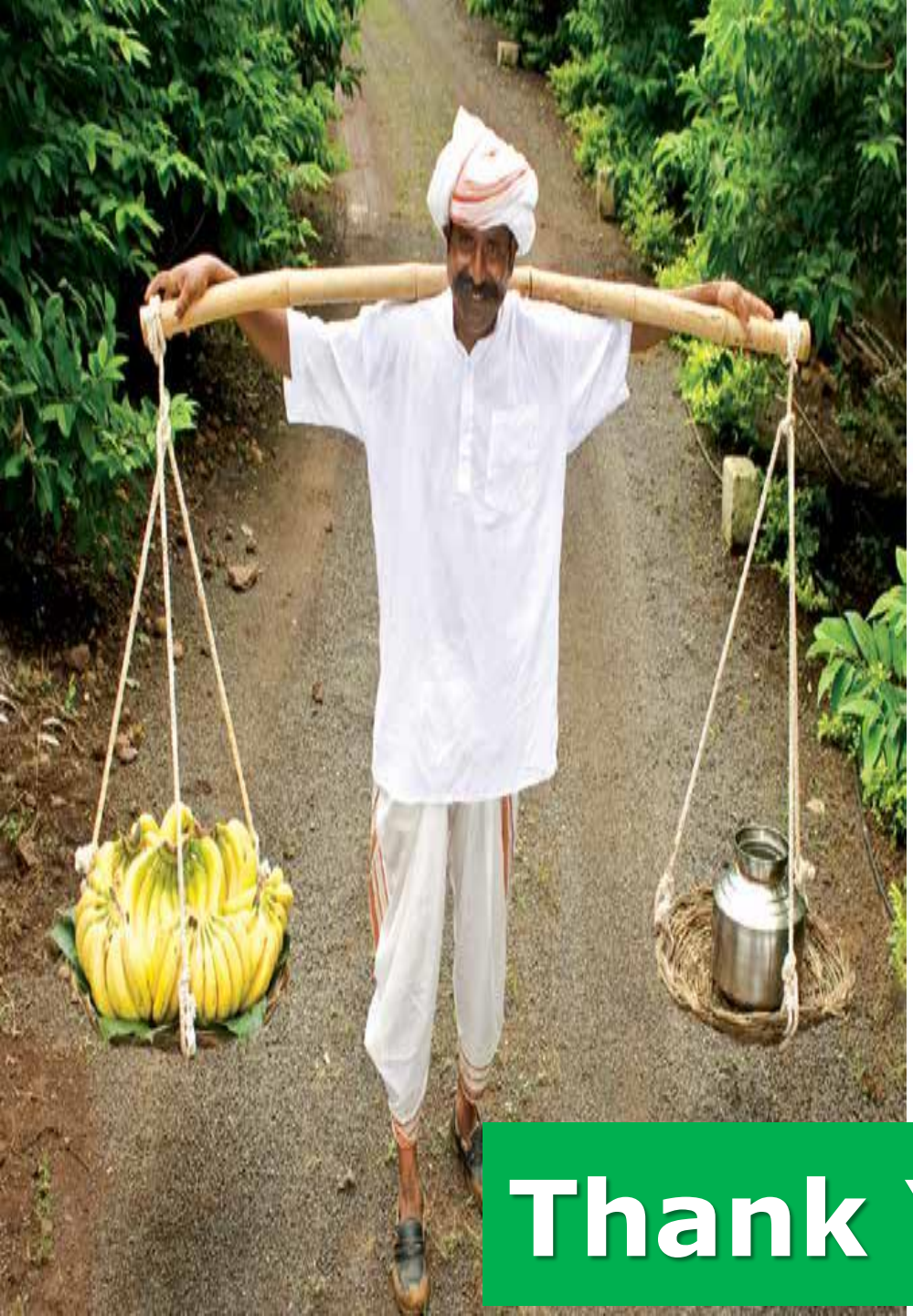
- ✓A single Model or Technology may not suit for all the areas.
- ✓Model or Technology or Solution needs to be location specific.
- ✓Chosen Model should be adoptable to various local factors such as topography, cropping patterns, marketability, cultural diversity, and so on.
- ✓Consultant/Supplier should be present in the project areas with a very high degree of commitment for successful long term utility of proposed technologies.
- ✓Training and Extension (farmer awareness) resources are key inputs for bringing in a change.

Suggested Policy Changes

- Future command areas to be designed with IIS in phased manner.
- Where feasible, adopt IIS & / or Micro Irrigation as last mile connectivity.
- IIS & Micro Irrigation to be treated as infrastructure and priority sector.
- Pragmatic feasibility of PPP model in IIS projects should be explored.
- An umbrella regulatory authority to sanction and monitor the IIS projects.
- It should coordinate fund allocation prior to announcement of projects.
- IIS projects may be compulsorily E-tendered on EPC basis.
- Projects under AIBP to be redesigned to include IIS.
- GoI may issue strict guidelines covering above aspects.

Summing up

- We can multiply value creation by factor of 4 if IIS is adopted as a National mission.
- India's time has come wherein it can seize the opportunity to bring up to 5 M Ha under irrigation in a short span of 10 years through IIS.
- It is noteworthy that only about 4 M Ha have been added under canal irrigation in past 40 years.
- Rarely there comes a time in the history of a Nation when so many can be empowered in such a short span – Salute to the Technology…!!



The best bottomline is a farmer's smile.

Thank You

THANK YOU

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