HYBRID TRAINING ETIQUETTE DO'S AND DON'TS

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ATAL BHUJAL YOJANA

Sustainable Ground Water Resource Management

Learning Duration- 4 Hours

Training Programme

Introductory

Module Overview

The following will be covered

01 Goals, Key Components and Key performance indicators under Atal Bhujal Yojana

02 Monitoring and Evaluating the effectiveness of Groundwater Management Strategies

03 Role of Stakeholders and Strategies for effective stakeholder engagement

04 Case Examples & Best Practices under groundwater management

05 Innovative approaches for sustainable groundwater recharge and developing strategies for scaling up ABHY interventions

Session Overview

SL. No.	Session no	Topic	Sub Topic	Time (in Min)
1	Session 1	**Goals, Key Components and Key performance indicators under Atal Bhujal Yojana**	Goals of Atal Bhujal Yojana	5 mins
			Key Components of Atal Bhujal Yojana	10 mins
			Identifying key performance indicators (KPIs) to measure the impact of ABHY.	10 mins
2	Session 2	**Monitoring and Evaluating the effectiveness of Groundwater Management Strategies**	Monitoring of Groundwater Management Strategies	10 mins
			Evaluation of Groundwater Management Strategies	10 mins
			Groundwater Resource Management	5 mins
BREAK				15 mins
3	Session 3	**Role of Stakeholders and Strategies for effective stakeholder engagement**	Recap of the Previous Session	5 mins
			The role of stakeholders in Atal Bhujal Yojana Implementation	20 mins
			Strategies for effective stakeholder engagement and community Participation	15 mins

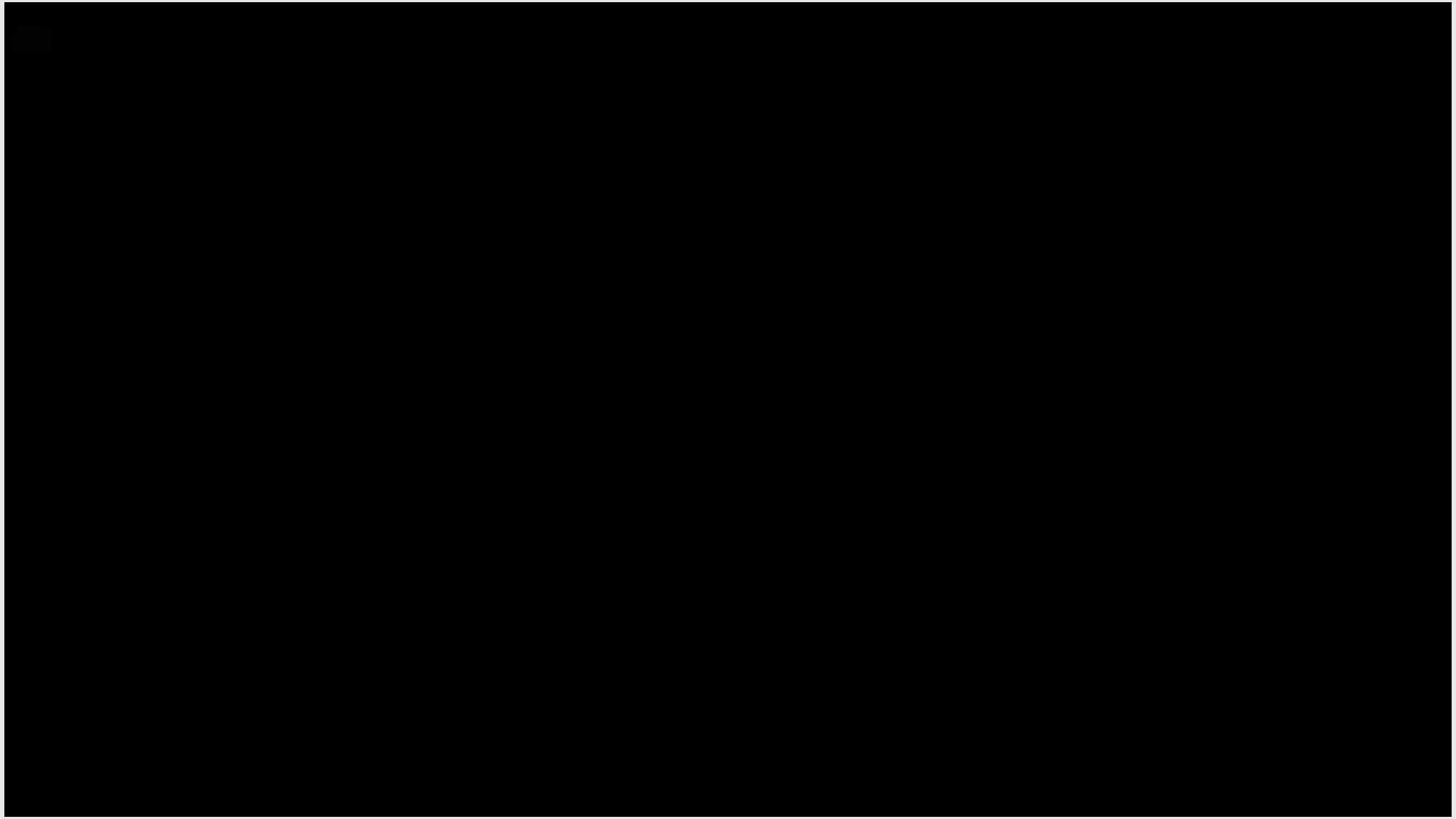
Session Overview

SL. No.	Session no	Topic	Sub Topic	Time (in Min)
4	Session 4	**Case Examples & Best Practices under groundwater management**	Recap of the Previous Session	5 mins
			Case Examples under Atal Bhujal Yojana Implementation	20 mins
			Best Practices in Haryana under ABHY implementation	10 min
5	Session 5	**Innovative approaches for sustainable groundwater recharge and developing strategies for scaling up ABHY interventions**	Promoting innovative approaches for sustainable groundwater recharge and use	20 min
			Developing strategies for scaling up ABHY interventions	15 min
			End note	10 mins

Understanding the goals & Key components of Atal Bhujal Yojana

Session - 1

Atal Bhuja Yojana: Haryana



Video Source: https://ms-my.facebook.com/atalbhujalhry/videos/atal-bhujal-yojana-haryana-a-short-documentary-regarding-silent-features-of-atal/5225359600912603/

About Atal Bhujal Yojana Mission

Atal Bhujal Scheme is a Central Sector Scheme

That aims to enhance groundwater management via community participation.

Assures the long-term sustainability of groundwater in India.

The Prime Minister of India dedicated this scheme to former Prime Minister Atal Bihari Vajpayee.

Launched it on 25 December 2019 the 95th birth anniversary of the former PM.

DURATION:
2021-2025

CLIMATE RESILIENT
Source sustainability included-Jal Shakti Abhiyan & Atal Bhujal Yojana

BUDGET OUTLAY
Total estimated cost of Atal Bhujal Yojana is **Rs. 6,000 Cr.**

3000 Cr. WORLD BANK

3000 Cr. GOI

Source: https://ataljal.mowr.gov.in/

STATES TO BE COVERED- ATAL BHUJAL YOJANA

The Department of Water Resources, Ministry of Jal Shakti, and River Development & Ganga Rejuvenation is following a ***unique strategy to identify groundwater-stressed blocks in seven states.***

1. **HARYANA**
2. **Karnataka**
3. **Madhya Pradesh**
4. **Maharashtra**
5. **Uttar Pradesh**
6. **Rajasthan**
7. **Gujarat**

- To be precise, the list of districts chosen for the Atal Bhujal Yojana includes
- **78 districts** and
- Approximately **8350 panchayats**.

Source: https://ataljal.mowr.gov.in/

COMPONENTS OF ATAL BHUJAL YOJANA

This Atal Bhujal Yojana has **two components**.

1. **Incentive Component** for incentivising the States for achievements in **improved groundwater management practices**

2. **Institutional Strengthening** and **Capacity Building Component**

Source: https://ataljal.mowr.gov.in/

Objectives of ATAL BHUJAL YOJANA

1. Encourage **Community Engagement** and inculcate **behavioural changes at Gram Panchayat level**.
2. To **Strengthen the institutional and information**
3. **Capacity building** of all stakeholders at different levels.
4. **Community led groundwater management**
5. Support participating states in **applying alternative approaches to groundwater governance.**
6. Facilitate **Sustainability in groundwater management**.

Source: https://ataljal.mowr.gov.in/

BENEFITS OF ATAL BHUJAL YOJANA

- Helps to **revive water bodies**, and **improve groundwater level**s, especially in **rural areas**.
- Allows local communities' **active participation** that ensures sources' sustainability.
- Will help to **double the farmer's income.**
- Boosts **participatory groundwater management**, **enhanced cropping patterns** and efficient water usage on a larger scale.
- Will help to promote **the equitable and efficient use of groundwater** usage and bring behavioural changes at community levels.

Source: https://ataljal.mowr.gov.in/

ATAL BHUJAL YOJANA: KEY FIGURES

Area of Implementation

S.NO.	State	Districts	Blocks	GPs
1	Gujarat	7	34	2201
2	**Haryana**	**14**	**36**	**1656**
3	Karnataka	14	41	1199
4	Madhya Pradesh	6	9	672
5	Maharashtra	13	38	1339
6	Rajasthan	17	38	1144
7	Uttar Pradesh	10	26	550
	TOTAL	**81**	**222**	**8763**

Allocation of funds

Component	NPMU	GUJ	HAR	KAR	M.P	MAH	RAJ	U.P	TOTAL
Institutional Strengthening And Capacity Building	159.33	217.65	**207.15**	194.51	103.62	188.26	164.68	119.28	1354.48
Incentive		539.11	**470.52**	1007.01	210.92	737.51	1024.97	609.96	4600.00
TOTAL	**159.33**	**756.76**	**677.52**	**1201.52**	**314.54**	**925.77**	**1189.65**	**729.24**	**5954.48**

***All the figures are in Cr.**

Source: https://ataljal.mowr.gov.in/

Key Performance Indicators (KPIs) to measure the Impact of Atal Bhujal Yojana

The Atal Bhujal Yojana (ABHY) is a government scheme in India aimed at sustainable management of groundwater resources. To measure the impact of the Atal Bhujal Yojana, you can consider the following key performance indicators (KPIs):

These KPIs can help in monitoring and evaluating the impact of the Atal Bhujal Yojana and guide future interventions and policy decisions for sustainable groundwater management.

Key Performance Indicators (KPIs) to measure the impact of Atal Bhujal Yojana

1. Groundwater level stabilization: The KPI should focus on stabilizing declining groundwater levels and preventing further depletion.

2. Groundwater recharge: Assess the increase in the recharge of groundwater resources through various measures implemented under ABHY, such as rainwater harvesting, watershed management, and artificial recharge structures.

3. Water use efficiency: This can be measured by comparing the amount of water used for agricultural, domestic, and industrial purposes before and after the implementation of ABHY.

4. Community participation: This can include the number of community meetings held, participation in decision-making processes, and involvement in groundwater management activities.

5. Institutional strengthening: Assess the strengthening of institutions responsible for groundwater management, such as water user associations, local government bodies, and groundwater regulatory agencies.

Key Performance Indicators (KPIs) to measure the impact of Atal Bhujal Yojana

6. Policy and regulatory improvements: Measure the development and implementation of new policies, regulations, and guidelines that promote sustainable groundwater practices.

7. Awareness and behavior change: This can be assessed through surveys, interviews, and monitoring the adoption of best practices by farmers, industries, and households.

8. Impact on agriculture: Measure the adoption of efficient irrigation practices, crop diversification, and the reduction in water-intensive cropping patterns.

9. Environmental impacts: Such as improved ecological health, preservation of groundwater-dependent ecosystems, and reduced energy consumption for groundwater extraction.

10. Socio-economic benefits: Including increased livelihood opportunities, poverty reduction, gender inclusion, and improved access to safe drinking water.

Learning Resources

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ATAL BHUJAL YOJANA

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Monitoring & Evaluating the effectiveness of Groundwater Management Strategies

Session - 2

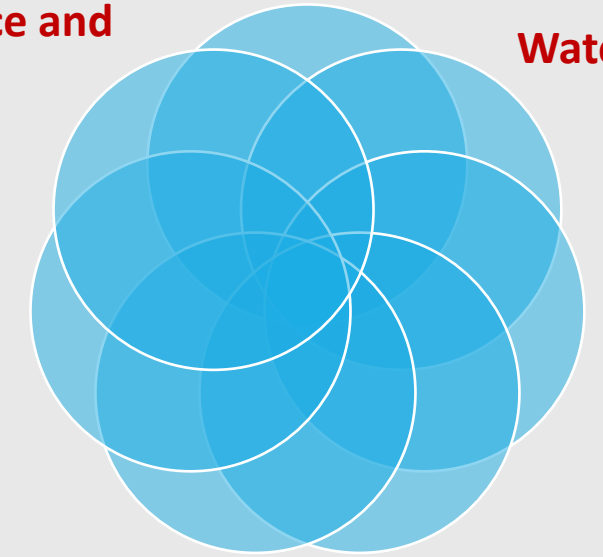
Monitoring of Groundwater Management Strategies

Monitoring of groundwater management strategies involves the systematic collection and analysis of data related to groundwater resources and their use. It is an essential component of effective groundwater management and helps to assess the performance and impact of various strategies implemented to sustainably manage groundwater.
Here are some key aspects and methods used in monitoring groundwater management strategies:

Groundwater Level Monitoring

Regulatory Compliance and Permitting

Water Quality Monitoring



Community Engagement and Stakeholder Feedback

Pumping Tests

Water Balance and Modeling

Remote Sensing and GIS

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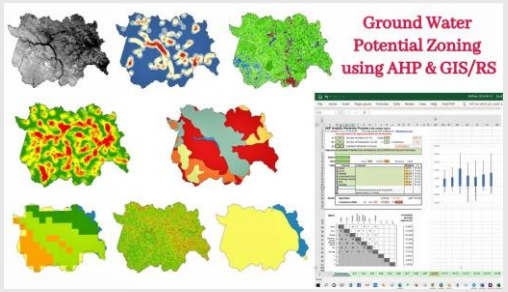
Groundwater Level Monitoring

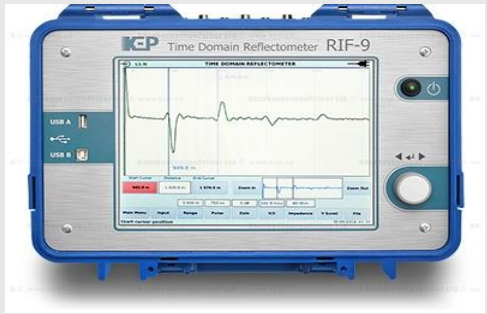
1.Groundwater Level Monitoring: Monitoring the groundwater levels is crucial to understand the aquifer dynamics and assess the impact of extraction. It involves regularly measuring water levels in monitoring wells or piezometers distributed across the study area. These measurements provide insights into groundwater fluctuations, long-term trends, and potential water level declines or rises.

Water Level Tape/Staff Gauge:

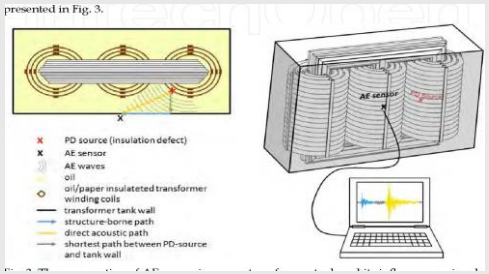
Satellite-based Remote Sensing



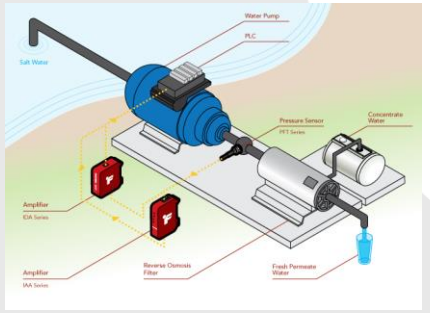
Time Domain Reflectometry (TDR)



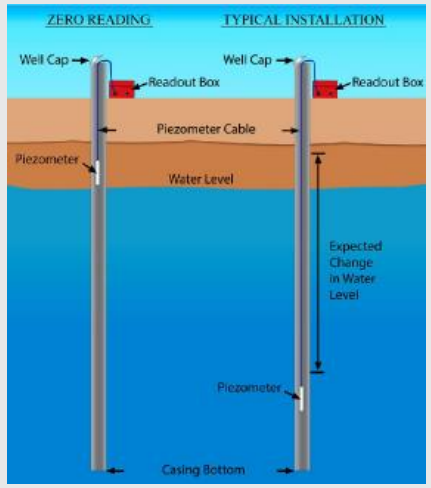
Acoustic Method



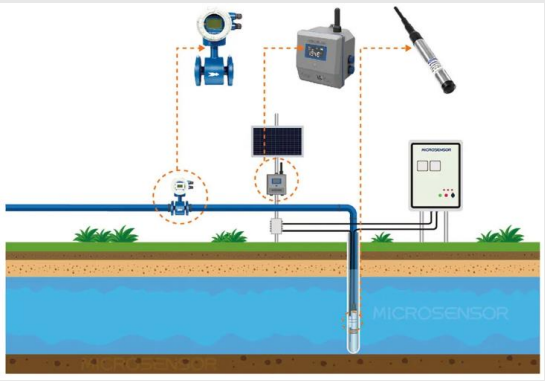
Pressure Transducers



Vibrating Wire Piezometers



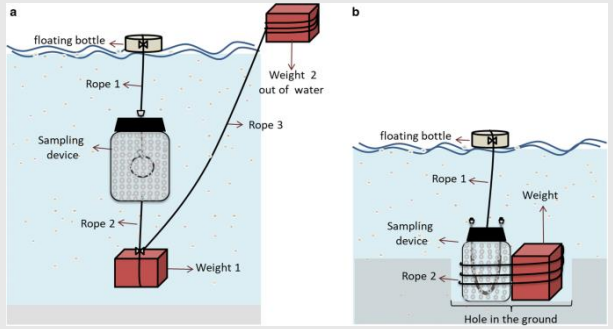
Electrical Conductivity/ Resistance Sensors



Water Quality Monitoring

Water Quality Monitoring: Monitoring water quality is essential to assess the chemical composition of groundwater, identify contamination sources, and ensure its suitability for various uses. Parameters such as pH, electrical conductivity, dissolved oxygen, major ions, nutrients, heavy metals, and contaminants of concern are measured to evaluate groundwater quality.

Grab Sampling

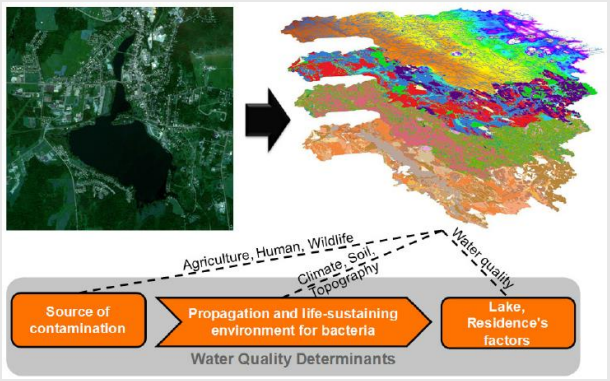


In Situ Probes and Sensors

Real-Time Polymerase Chain Reaction (PCR)

Water Quality Testing Kits

Remote Sensing

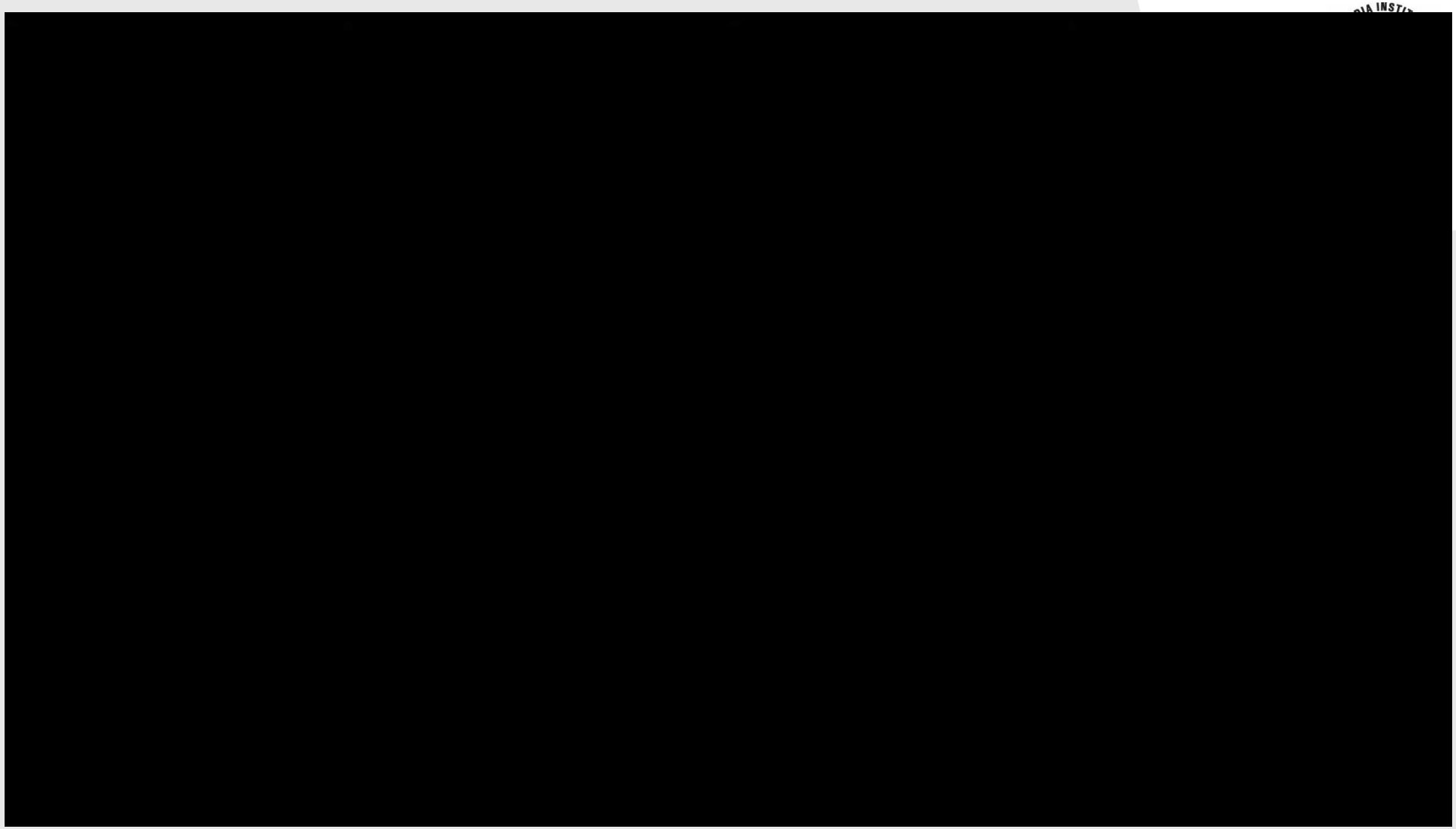


Automated Water Quality Monitoring Stations

Water Quality Monitoring video

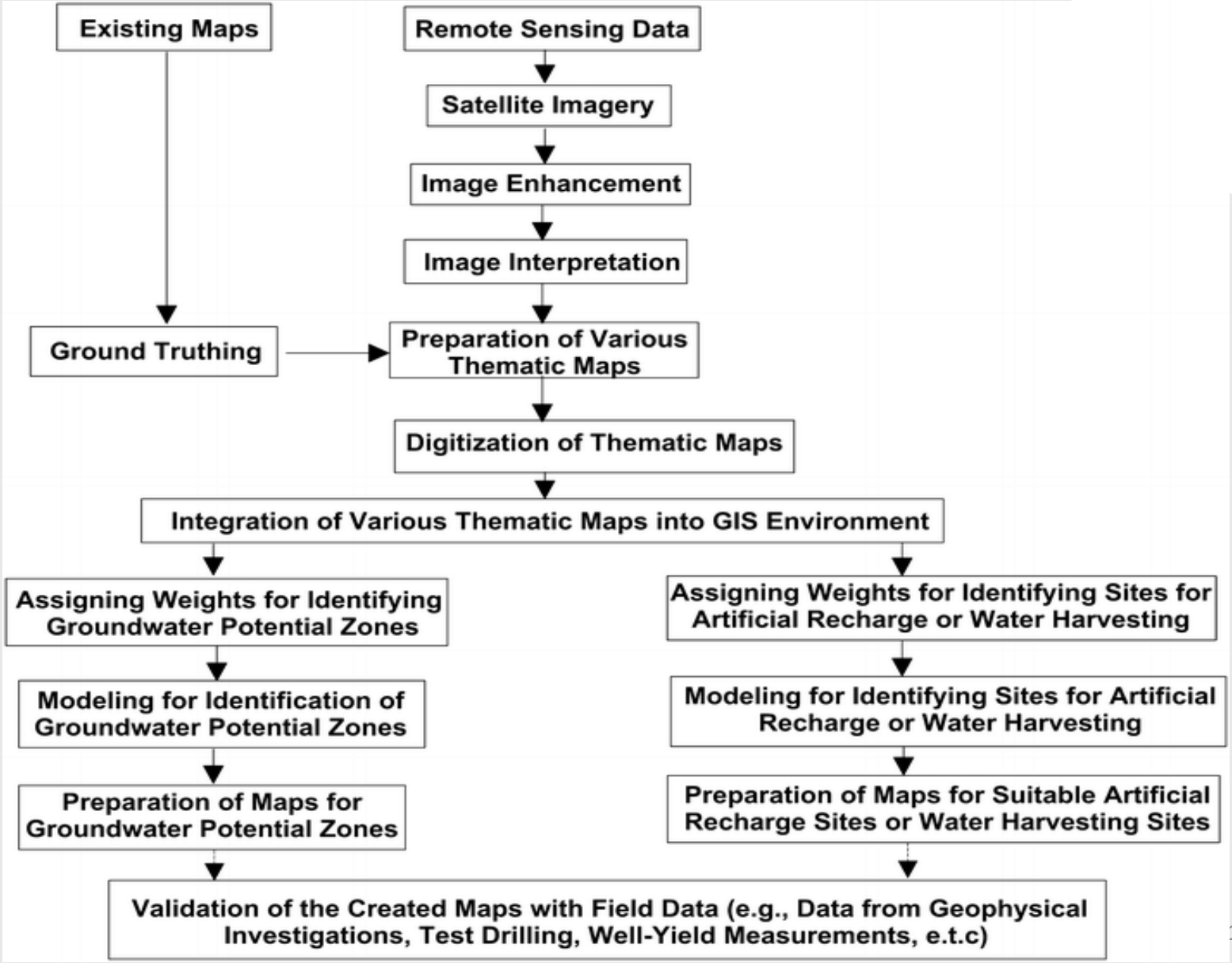
Pumping test- Video

Pumping Tests: Pumping tests involve controlled extraction of groundwater from specific wells to assess aquifer properties, such as hydraulic conductivity, transmissivity, and storage coefficient. These tests provide valuable information for designing efficient well networks, estimating sustainable pumping rates, and evaluating aquifer response to pumping.



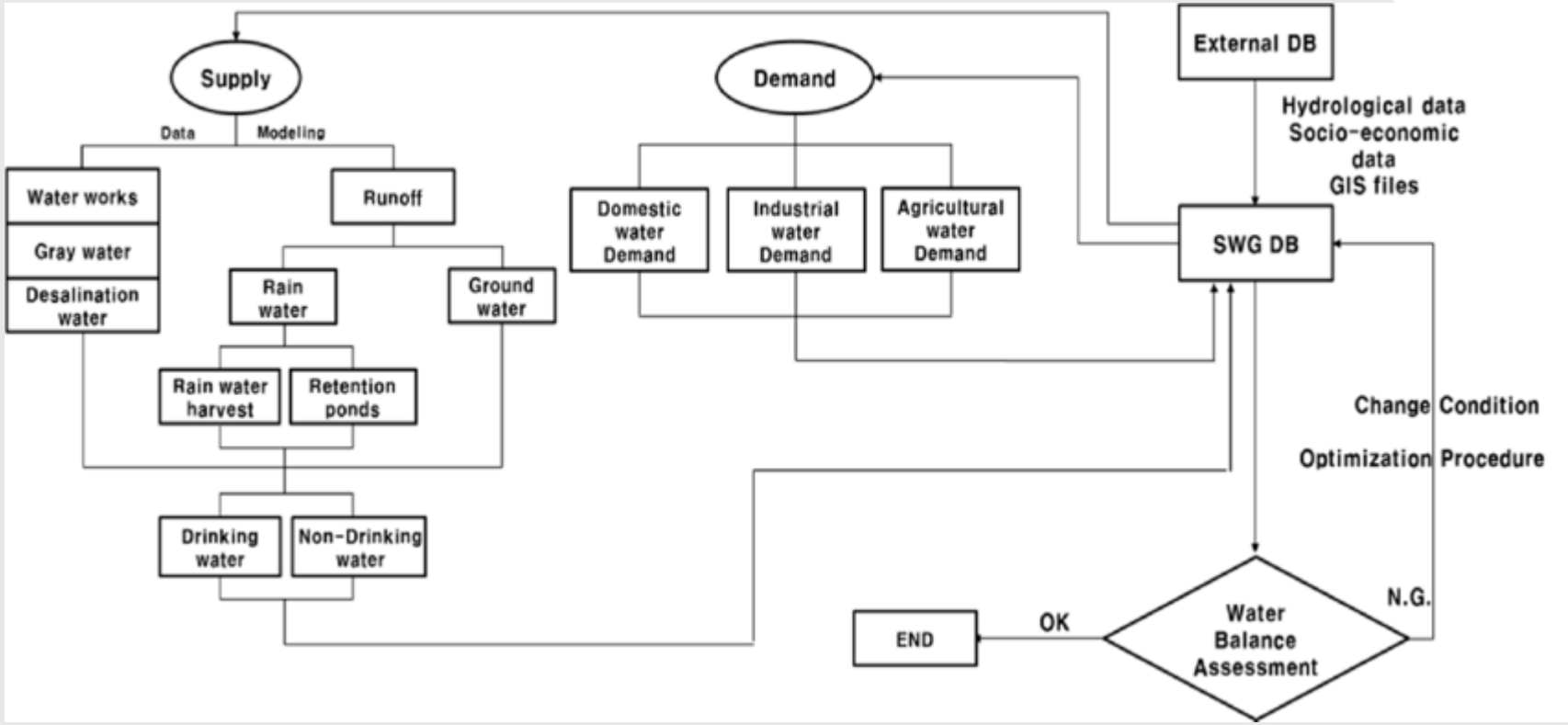
Remote Sensing and GIS

Remote Sensing and GIS: Remote sensing technologies, such as satellite imagery and aerial photography, coupled with Geographic Information Systems (GIS), are powerful tools for monitoring large-scale changes in land use, vegetation cover, and surface water bodies. These data can be integrated with groundwater data to analyze the relationship between groundwater and surface water systems.



Water Balance and Modeling

Water Balance and Modeling: Water balance assessments involve quantifying the inputs (recharge) and outputs (abstractions and discharges) of the groundwater system. By comparing these components, it is possible to evaluate the sustainability of groundwater management strategies. Additionally, groundwater flow models can be used to simulate and predict the behavior of the aquifer under different scenarios.

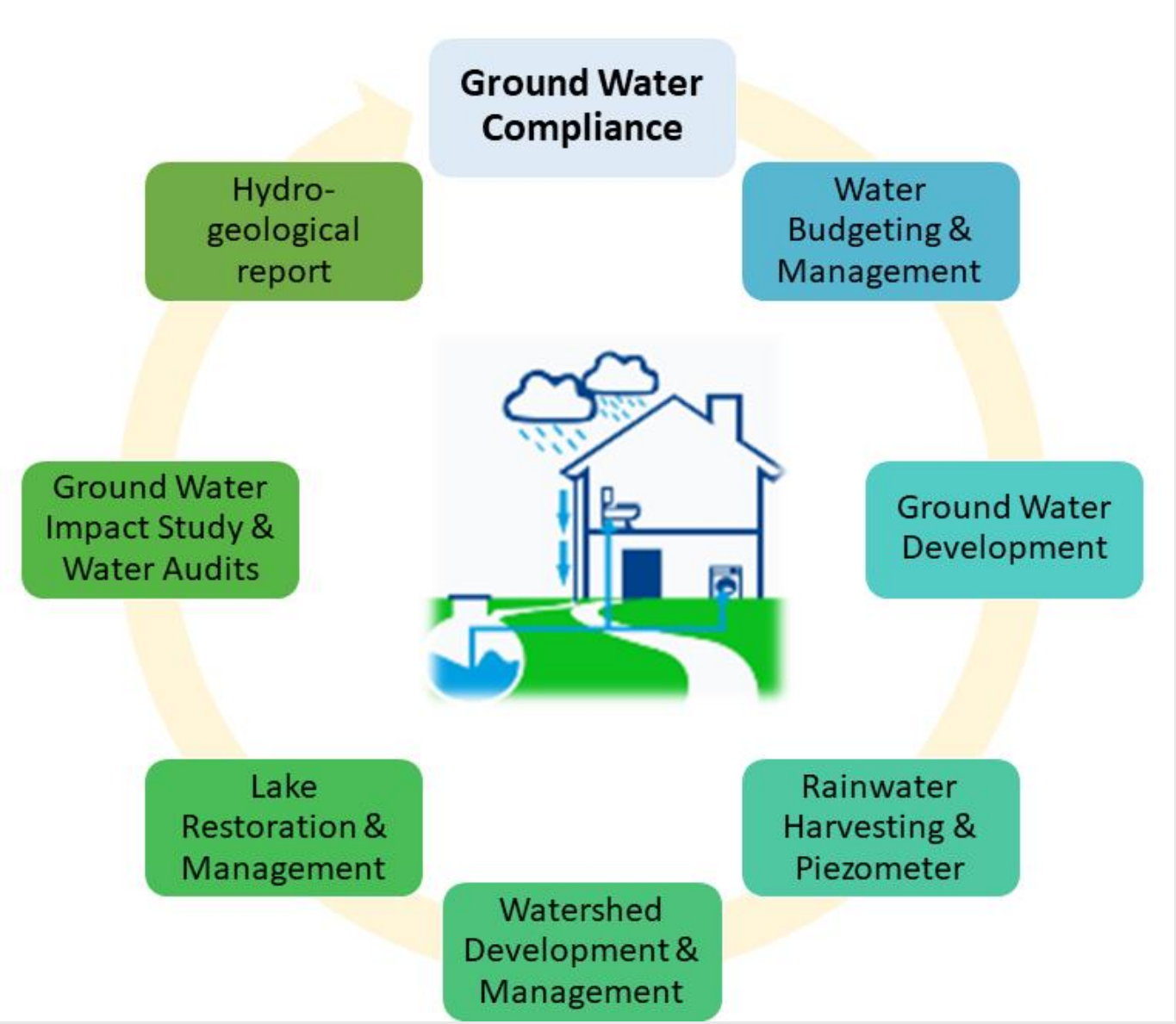


Community Engagement and Stakeholder Feedback

1. Presence of women as a critical mass helps in inclusion of actual felt needs of **women in decision making**
2. Ensure greater participation of women in Gram Sabha meeting to **facilitate inclusion of women's** needs in development planning and decision making
3. For ensuring and **promoting gender mainstreaming** in development planning, implementation and inclusion of gender specific needs
4. Studies have validated that **women-headed Panchayats have brought about a shift in the development** agenda,
5. Create conducive environment for enabling opportunities of **strengthening women's role** under Har Ghar Jal programme

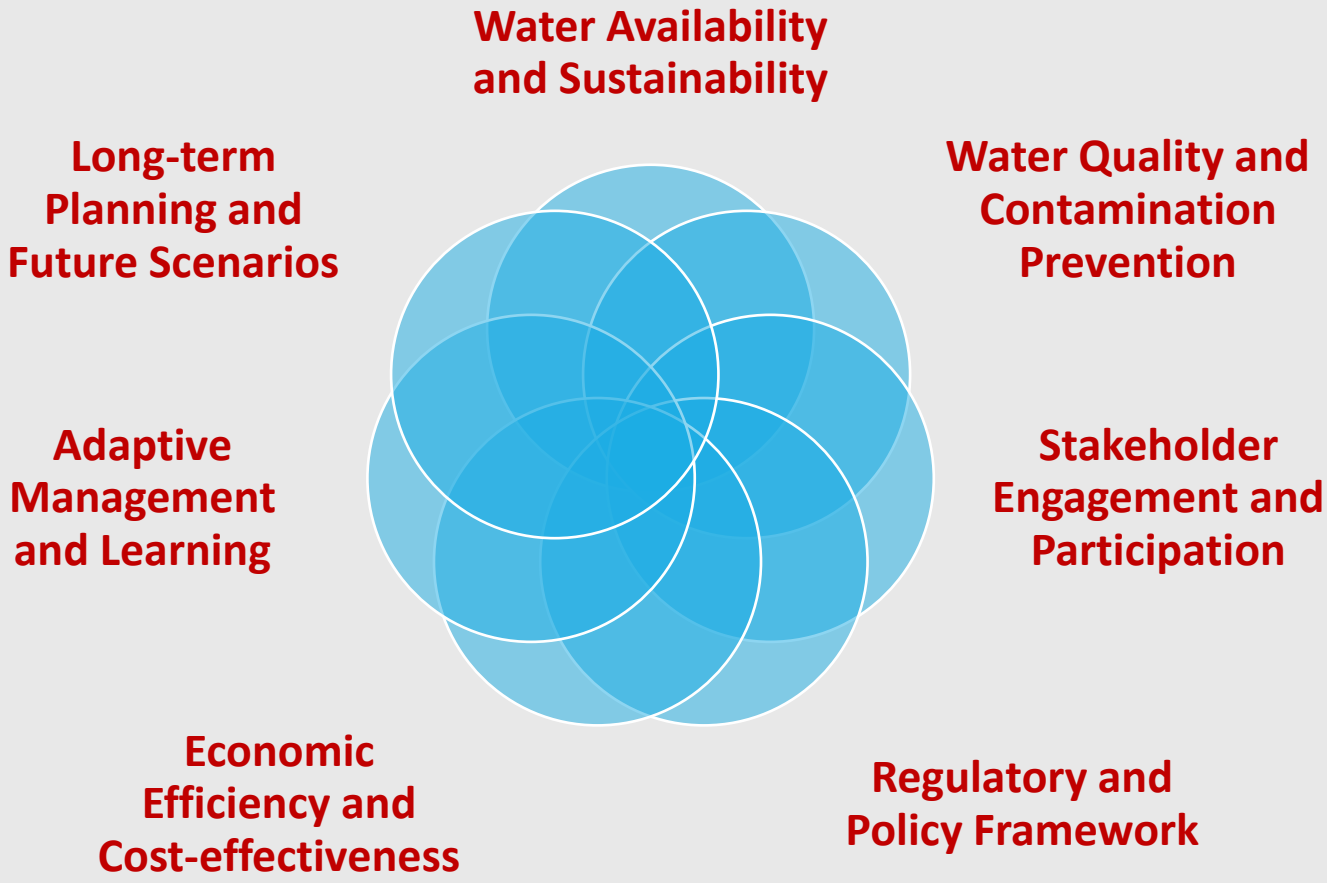
Regulatory compliance and Permitting

Regulatory Compliance and Permitting: Monitoring groundwater management strategies also involves ensuring compliance with applicable regulations and permits. This includes tracking water abstractions, water use permits, and implementing enforcement mechanisms to prevent illegal or unsustainable groundwater use.



Evaluation of Groundwater Management Strategies

The evaluation of groundwater management strategies involves assessing the effectiveness, efficiency, and sustainability of the strategies implemented to manage and protect groundwater resources. It helps in understanding whether the strategies are achieving their intended goals, identifying areas for improvement, and making informed decisions for future management actions. Here are some key aspects to consider when evaluating groundwater management strategies:



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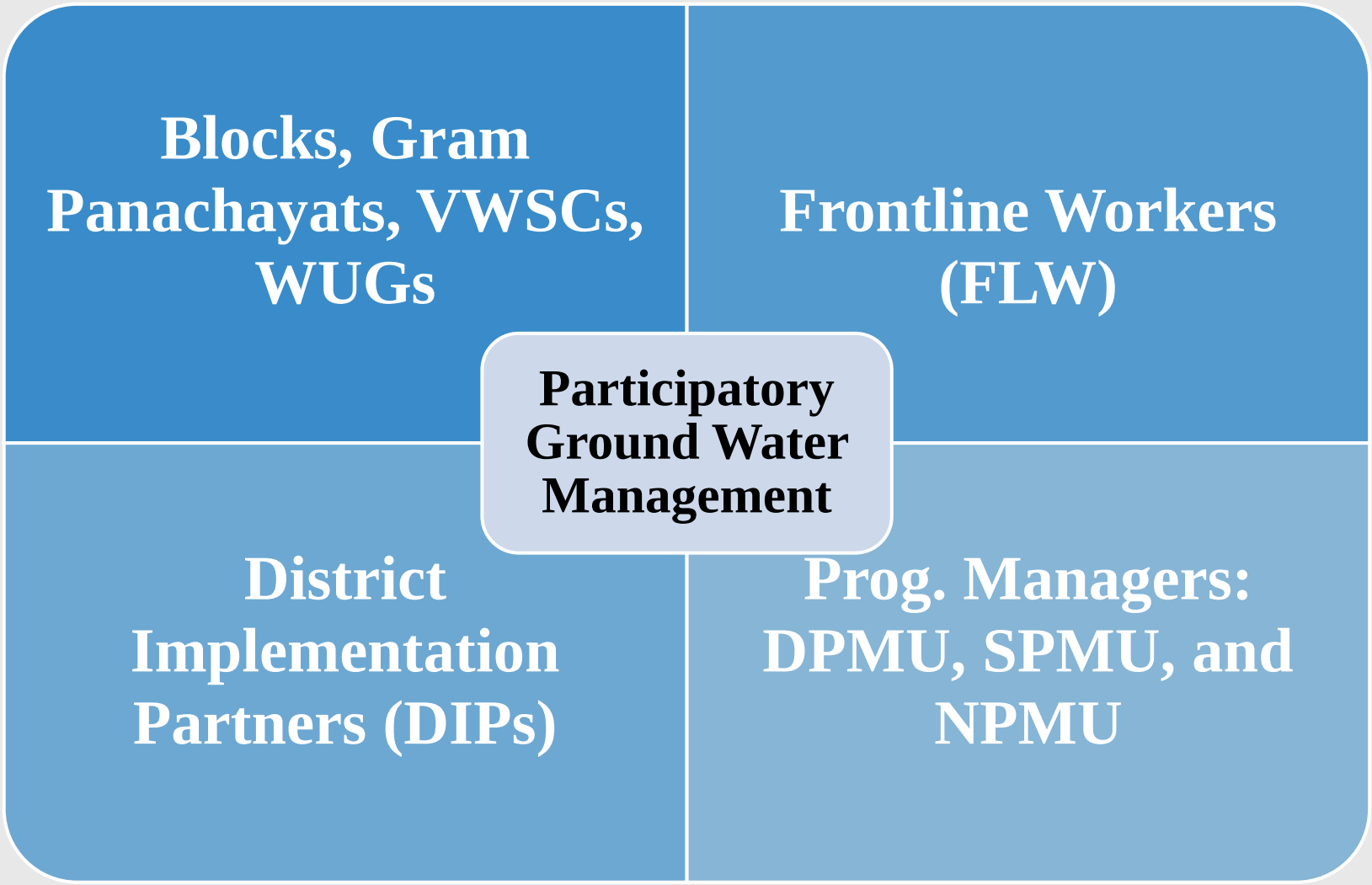
			Best Practices in Haryana under ABHY implementation	10 min
5	Session 5	**Innovative approaches for sustainable groundwater recharge and developing strategies for scaling up ABHY interventions**	Promoting innovative approaches for sustainable groundwater recharge and use	20 min
			Developing strategies for scaling up ABHY interventions	15 min
			End note	10 mins

The role of Stakeholders in Implementation of the ABhY

Session - 3

Stakeholders Involved in ABhY



NPMU:- National Program Management Unit

SPMU:- State Program Management Unit

DPMU:- District Program Management Unit

VWSCs:- Village Water and Sanitation Committee

WUGs:- Water User Groups

Source:- Atal Bhujal Yojana Haryana, Peoples Science Institute, SPMU

Key Deliverables under Atal Bhujal Yojana

1. Public disclosure of **groundwater data/ information and reports**
2. Preparation of **Community-led Water Security Plans**
3. **Public financing of approved Water Security Plans** through convergence of ongoing/new schemes
4. **Adoption of practices** for efficient water use
5. Improvement in the **rate of decline of groundwater levels**

Source:- Atal Bhujal Yojana Haryana, Peoples Science Institute, SPMU

Role of Stakeholders & Officials

Level of Governance	Work to be implemented
Block and Gram Panchayat (GP) Level	**i) Ensuring community participation in planning sustainable management of ground water,** **ii) Development of GP level water budgets** **iii) Preparation of GP-level Water Security Plans (WSPs).**
District Level	i) Consolidation, validation and aggregation of WSPs ii) Ensuring convergence with other schemes and missions in the WSPs. iii) Evaluate and identify measures that are needed to ensure that the investments have their intended impact. iv) Allocation of budget from various sources for investments / interventions in the district level aggregated plans

Role of Stakeholders & Officials

Level of Governance	Work to be implemented
State Level	i) State Level ii) Ensuring community participation in planning sustainable management of ground water, iii) Development of GP level water budgets iv) Preparation of GP-level Water Security Plans (WSPs).
Central Level	i) Coordination of the scheme at the national level. ii) The States will submit approved state-level Plans to the NPMU for data, budget, and expenditure consolidation and finally to the National Inter-Departmental Steering Committee for ratification. iii) Implementation and Facilitation of Approvals, M&E functions and Training and capacity building activities.

Creation of a Water Budgets for Sustainability

1. This is an accounting tool of available water resources and various uses at the GP level.

2. The purpose of the water budget is to assess surface and groundwater resources and identify current and future needs as a basis for planning.

3. The water budget will be prepared by the GP with the help of the DPMU and SPMU.

4. The water budget document will be updated on a regular basis (preferably season-wise, but at least every year).

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

6 Key Components of a Water Budgets for GP

Basic data of the area of Intervention like population, No. of households, no. of villages, No. of wards etc.

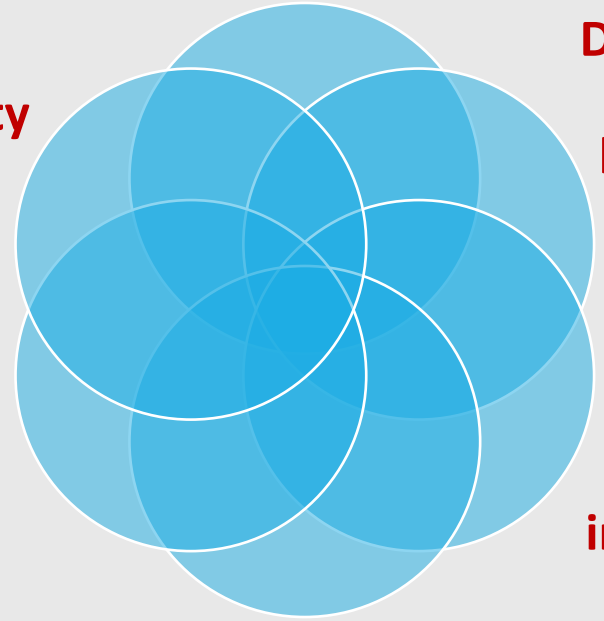
Domestic and drinking water demands for human consumption

Livestock, institutional demands

Current draft/use for agriculture and other purposes, with current sources and their yield potential

Gap analysis of demand and supply

Equity & sustainability



Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

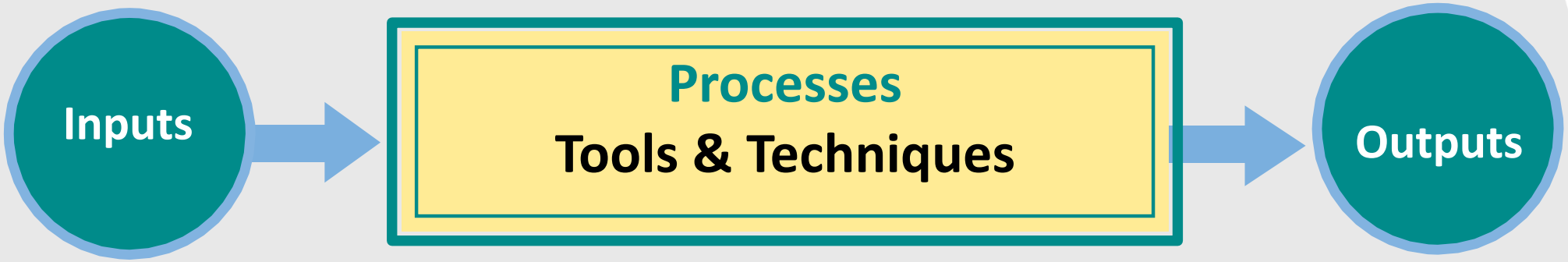
Preparation of Water Security Plan

COMMUNITY-LED WATER SECURITY PLANS

- Orientation of community on the objective of Atal Bhujal Yojana
- Initiating the process of preparation of Water Security Plans (WSP) through active engagement of Committee members
- Regular meetings with the community for disclosure of data on water availability, utilization and balance in their GPs
- Discussion and dialogue with the community on demand and supply side interventions to mitigate the decline in groundwater
- Preparation of WSPs after incorporating community inputs
- Approval of WSP by the committee an d community

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

WSP Phases : Expected Outputs



Activity Code	Phase	Expected Output
P	Phase 1: Preparatory Phase (P)	
P1	Institutional arrangement for DWSP	Block-level institutional arrangement covering DWSM, BRC and SO, contact line department person for the water security plan to be put in place
P2	compilation of secondary data by District nodal officer	DWSM approves secondary data for all GPs

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

WSP Phases : Expected Outputs

Activity Code	Phase	Expected Output
C	Phase 2: capacity Building, Survey and Planning (c)	
C1	GP-level Mobilization & convergence Meeting (GP-l-MCM)	• Agreed to participate • GP resolution to participate
C2	Gram Sabha (habitation-level Meeting)-1	• Gram Sabha resolution to participate
C3	Formation/strengthening of VWSC1	• List of VWSC members, VWSC bank account and Swacchata Dooth selection
C4	Participatory rural appraisal (PRA)	• Social map • Resource map • Timeline & seasonality (water availability and diseases) • Community- Led Total Sanitation (CLTS) and development of sanitation plan

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

WSP Phases : Expected Outputs

Activity Code	Phase	Expected Output
C	Phase 2: capacity Building, Survey and Planning (c)	
C5	Water transect—walk from source to users	• Identification of issues
C6	Establishment of rain gauge station	• At least one rain gauge station per GP, regular observation and recording of rainfall data
C7	WTQQ (WT- Water Table, Q -Quantity and Q Quality) monitoring of selected bore/tubewell	• WTQQ monitoring and recording of data of selected bore/tube well
C8	Water budget estimation	• As described earlier
C9	Women's meeting	• Awareness-raising and updating water budget and input for plans

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

WSP Phases : Expected Outputs

Activity Code	Phase	Expected Output
C	Phase 2: capacity Building, Survey and Planning (c)	
C10	School-level programme	• Dissemination of information gathered during PRA and water budget • Developing school action plan for DWSP and sanitation
C11	Exposure visit—village implementing DWSP	• Learning DWSP plan and implementation, clarifying issues and constraints • Exchange of outcomes of water budget and DWSP plan
C12	VWSC- 2 Workshop—Water Security Plan Development	Moving towards water security planning • Technical • O&M management • Institutional
C13	Gram Sabha II	Approval of DWSP
C14	GP-level compilation meeting (GP-2)	Consolidation and approval of village DWSP

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

WSP Phases : Expected Outputs

Activity Code	Phase	Expected Output
I	Phase 3: Implementation Stage (I)	
I1	VWSC meeting • Details of works • Mode of implementation • Formation of Village Quality Assurance Team (VQAT)	• VQAT in place • Project components together with project cost is displayed in a prominent place
I2	Periodic joint review of works by VWSC, GP, PHE D, Zilla Parishad (ZP)	• Project progress and quality reviewed by the VWSC and VQAT
I3	O&M of existing scheme and drinking water conservation programme	• O&M initiated by VWSC • Water conservation programme implemented by VWSC • % reduction of water consumption and electricity demonstrated

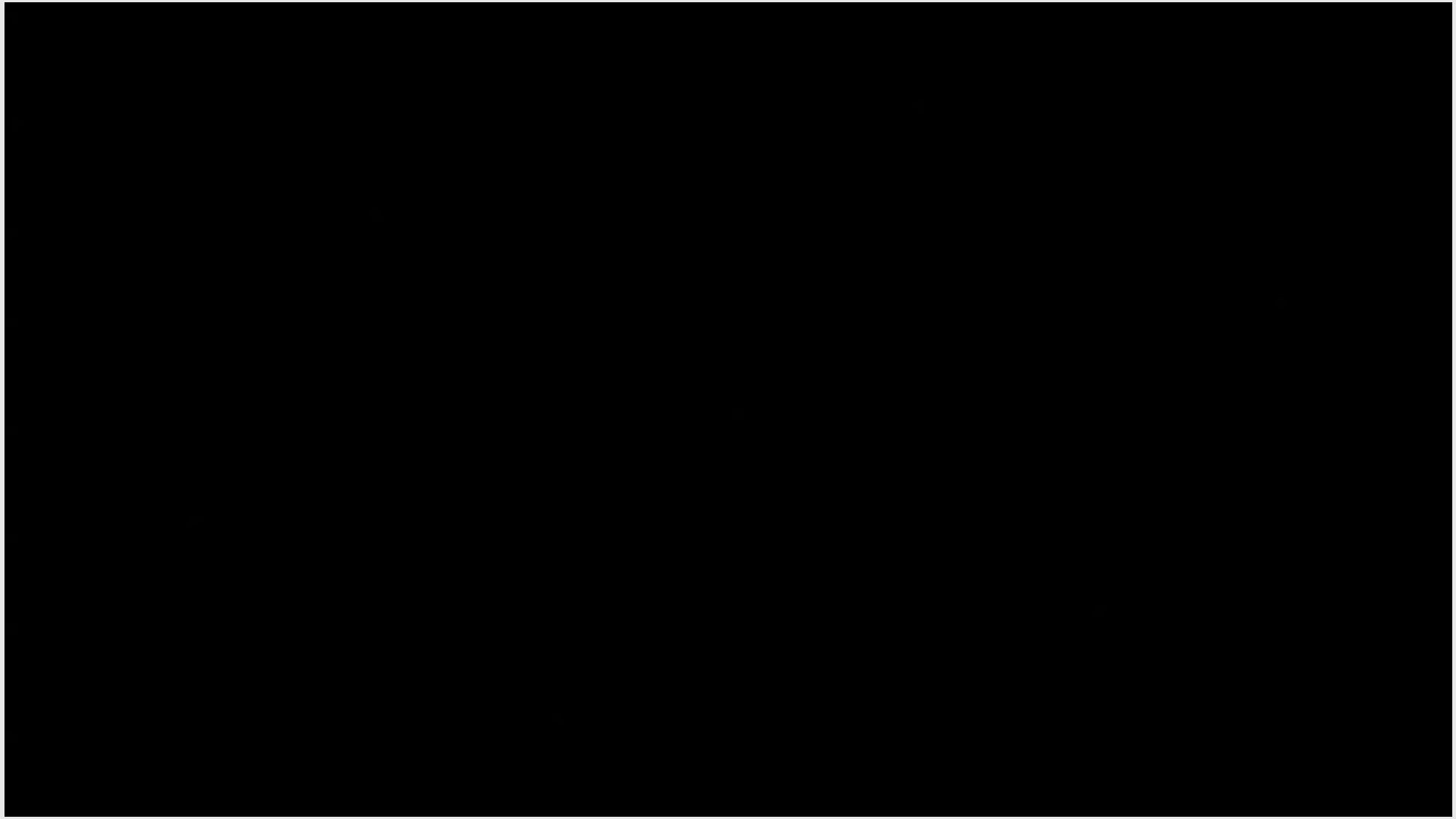
Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

WSP Phases : Expected Outputs

Activity Code	Phase	Expected Output
M	Phase 4: Monitoring (M)	
M1	Monthly monitoring of WTQQ	• Water table, quality of drinking water source monitored and quantity of other sector analysed
M2	Survey to assess the number of individuals using toilets	• % increase in number compared to baseline data
M3	Water consumption survey for various sectors	• Sector-wide water consumption
M4	Media scanning	• Increased number of success stories and their dissemination at local, regional, national and international level

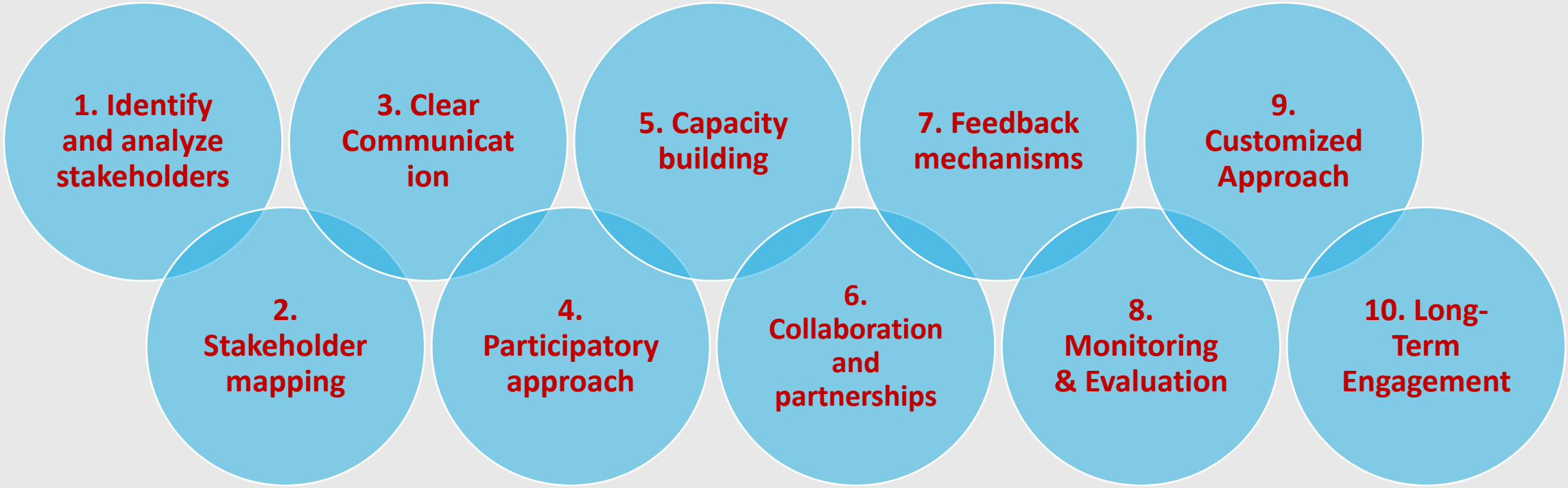
Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

Water Positive Villages in Kutch, Gujarat Video



Strategies for effective Stakeholder Engagement

The Atal Bhujal Yojana (ABHY) is a government initiative in India aimed at sustainable management of groundwater resources. Effective stakeholder engagement is crucial for the successful implementation of any program or project. Here are some strategies for effective stakeholder engagement in the context of ABHY:



Remember that effective stakeholder engagement requires a genuine commitment to listening, transparency, and accountability. By actively involving stakeholders, addressing their concerns, and building partnerships, you can enhance the success and sustainability of the Atal Bhujal Yojana.

Strategies for effective Stakeholder Engagement

1. Identify and analyze stakeholders: This may include government agencies, local communities, farmers, NGOs, experts, and water user associations.

2. Stakeholder mapping: Create a stakeholder map or matrix to categorize stakeholders based on their level of influence and interest in ABHY.

3. Clear communication: Develop a comprehensive communication plan to ensure stakeholders are well-informed about ABHY's objectives, benefits, and implementation process.

4. Participatory approach: Involve stakeholders in the decision-making process from the early stages of planning to the implementation and monitoring phases.

5. Capacity building: Conduct capacity-building programs to empower stakeholders with the necessary knowledge and skills related to groundwater management, conservation techniques, etc.

6. Collaboration and partnerships: Foster collaboration among different stakeholders to leverage their expertise, resources, and networks.

7. Feedback mechanisms: Establish feedback mechanisms that allow stakeholders to provide input, report issues, and seek clarifications.

8. Monitoring and evaluation: Implement a robust monitoring and evaluation system to track the progress of ABHY and assess its impact.

9. Customized approach: Recognize the diversity of stakeholders and tailor engagement strategies accordingly.

10. Long-term engagement: Stakeholder engagement should be an ongoing process throughout the implementation of ABHY.

Learning Resources

Scan the QR code to access Atal Bhujal Guidlines
or Website http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

Scan the QR code to access Atal Bhujal – Dashboard or Website
https://ataljal.mowr.gov.in/Home/Index

Scan the QR code to access Atal Bhujal News
or Website https://ataljal.mowr.gov.in/

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MIND YOUR BODY LANGUAGE AND VOICE OF OPINION

Be attentive and a careful observer, you will be in direct sight of everyone. Come in with additional insights to add value to the conversation.

KEEP YOUR QUESTION MINIMAL AND ON THE TOPIC

Questions or queries to resource person, facilitator or fellow participants should be sent using CHAT option or raise your hand. Be straightforward and time conscious.

BE PREPARED FOR TECHNICAL DIFFICULTIES

In case of voice issues, leave the meeting and join again by call/dial into the meeting platform for audio clarity. In case of technical glitches, be prepared to cover unforeseen events that could happen.

DON'T LEAVE THE MEETING WITHOUT INFORMING THE HOST

Thank the facilitator/host/speaker before leaving the meeting.

ATAL BHUJAL YOJANA

Sustainable Ground Water Resource Management

Learning Duration- 4 Hours

Training Programme

Introductory Phase-II

Module Overview

The following will be covered

01 Goals, Key Components and Key performance indicators under Atal Bhujal Yojana

02 Monitoring and Evaluating the effectiveness of Groundwater Management Strategies

03 Role of Stakeholders and Strategies for effective stakeholder engagement

04 Case Examples & Best Practices under groundwater management

05 Innovative approaches for sustainable groundwater recharge and developing strategies for scaling up ABHY interventions

Session Overview

SL. No.	Session no	Topic	Sub Topic	Time (in Min)
1	Session 1	**Goals, Key Components and Key performance indicators under Atal Bhujal Yojana**	Goals of Atal Bhujal Yojana	5 mins
			Key Components of Atal Bhujal Yojana	10 mins
			Identifying key performance indicators (KPIs) to measure the impact of ABHY.	10 mins
2	Session 2	**Monitoring and Evaluating the effectiveness of Groundwater Management Strategies**	Monitoring of Groundwater Management Strategies	10 mins
			Evaluation of Groundwater Management Strategies	10 mins
			Groundwater Resource Management	5 mins
BREAK				15 mins
3	Session 3	**Role of Stakeholders and Strategies for effective stakeholder engagement**	Recap of the Previous Session	5 mins
			The role of stakeholders in Atal Bhujal Yojana Implementation	20 mins
			Strategies for effective stakeholder engagement and community Participation	15 mins

Session Overview

SL. No.	Session no	Topic	Sub Topic	Time (in Min)
4	Session 4	**Case Examples & Best Practices under groundwater management**	Recap of the Previous Session	5 mins
			Case Examples under Atal Bhujal Yojana Implementation	20 mins
			Best Practices in Haryana under ABHY implementation	10 min
5	Session 5	**Innovative approaches for sustainable groundwater recharge and developing strategies for scaling up ABHY interventions**	Promoting innovative approaches for sustainable groundwater recharge and use	20 min
			Developing strategies for scaling up ABHY interventions	15 min
			End note	10 mins

Source: http://www.spain-india.org/

Best Practices under Groundwater Management

Session – 4

Best Practices Across India in Community led Water security Plans

CASE STUDY -01 – Water Security Plan for Kutch Region, Gujarat

Source:- https://scroll.in/article/947957/in-this-gujarat-grassland-a-plant-introduced-in-the-1950s-is-disrupting-the-nomadic-way-of-life

- **Place of Implementation:** Kutch District, Gujarat
- **Agency:** Samerth, Arghyam
- **Year of Implementation:** 2001

- The Kutch region in Gujarat has **been experiencing a steady decline in the groundwater level.**
- This, along with **salinity and persistent droughts**, has made the region **extremely water-stressed.**
- Recently, the village grew **heavily dependent on the Narmada** to meet their growing demands.

Source:-https://scroll.in/article/920278/in-gujarat-lands-for-which-narmada-dam-was-built-reel-under-drought-even-as-factories-get-water

Best Practices Across India in Community led Water security Plans

CASE STUDY -01 – Water Security Plan for Kutch Region, Gujarat

Objectives

- **To design and implement the participatory groundwater management framework in the region.**

Interventions

- **Community resource persons** (or jal doots) were identified.
- Based on the survey, **a water security plan was designed.**
- The trends in **water levels and quality are regularly monitored**.
- Activities such as de-silting of existing ponds, building storage wells and check dams, assigning recharge zones in alluvial areas, etc. are done by the community.

Outcomes

- The project **has ensured security of drinking water in the region**.
- Efficient management of water now ensures its sufficient availability.
- The villages are **no longer dependent on tankers.**
- The Koli community **renovated two nearby talabs.**
- Water collection **reduced to 3–4 hours per day**, giving women sufficient time.

Source: Niti Aayog Best practice compendium

Best Practices Across India in Community led Water security Plans

CASE STUDY -02 – AQUIFER BASED GROUNDWATER MANAGEMENT, Pune District, Maharashtra

- **Place of Implementation:** Gadakwadi Village, Khed Tehsil, Pune District, Maharashtra

- **Agency:** Advanced Centre for Water Resources Development and Management (ACWADAM), Srinivasan Service Trust (SST) and Arghyam Trust

- **Year of Implementation:** 2015–16

- **Background**

- Gadakwadi **village faces severe water crisis in the summers**, forcing people to migrate in search of work.
- The people of **Gadakwadi embarked on a participatory groundwater management journey** with the ACWADAM, and Srinivasan Service Trust.

Mahila Sarpanch with the village infographics

Best Practices Across India in Community led Water Security Plans

CASE STUDY -02 – AQUIFER BASED GROUNDWATER MANAGEMENT, Pune District, Maharashtra

Objectives

- **To enable water security, enhance groundwater recharge, promote the efficient use of water** and develop a **water security plan** for the village.

Interventions

- **Awareness generation of the community** on groundwater management.
- Primary data such as water level and quality, rainfall, etc., collected.
- Prepared a groundwater management plan for the village.

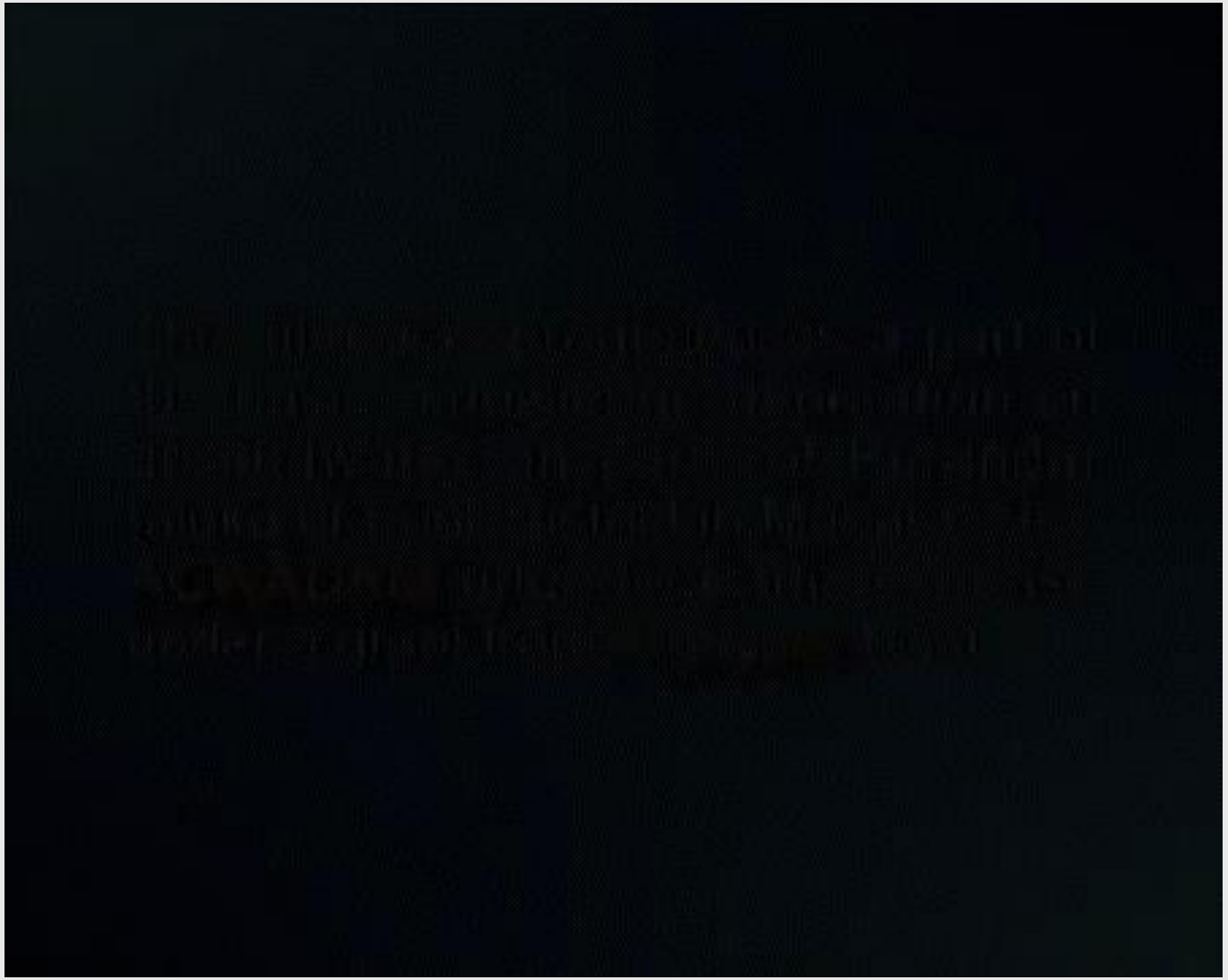
Outcomes

- Recommendations given under the groundwater management plan:
  1. Ban on drilling of borewells in the village
  2. Selection of groundwater recharge sites based on hydrogeological study
  3. Protocols for drinking water security
  4. Efficient use of water using drips and sprinklers
  5. Crop planning based on water availability
- **Water conservation structures** helped enhance the recharging capability of **aquifers**.
- The village became **completely tanker-free in 2017–18.**

Source: Niti Aayog Best practice compendium

Best Practices Across India in Community led Water Security Plans

CASE STUDY -02 – AQUIFER BASED GROUNDWATER MANAGEMENT, Pune District, Maharashtra



Video Source:-https://www.youtube.com/watch?v=25sWFuAYSVc&t=592s

Best Practices Across India in Participatory Groundwater Management

CASE STUDY -03 – **Participatory Irrigation Management (PIM) - Waghad, Maharashtra**

- **Place of implementation:** Maharashtra
- **Implementing agency:** Maharashtra Water Resource Authority, MoWR
- **Interventions:-**

- **Awareness programs** that promoted **conjunctive use of surface and ground water** which is monitored and regulated.
- Steps taken **to achieve equitable distribution of the resources.**
- During the formation of WUA's, **equal and active participation of both men and women** was also encouraged.
- The **farmers contributed 50 Lakh for rehabilitation cost** and 15% cost of office building.

Source: Niti Aayog Best practice compendium

Best Practices Across India in Participatory Groundwater Management

CASE STUDY -03 – Participatory Irrigation Management (PIM) - Waghad, Maharashtra

Achievements

- **Improvement in water use efficiency and water productivity**
- Irrigation area increased from **7885 Ha in 2004 to 9354 Ha in 2014-15.**
- **The water saving was 27%.**
- **The drip irrigation increased from 15% from 2004-05 to** 2014- 15.
- The area **increased in average income from INR 60000 to INR 2, 92,139.**

Takeaways

- **Participatory approach can help is judicious use of resources**
- Representation of an **equitable percentage of women.**
- Tail to head **distribution of resources helps in achieving equity.**

Source: Niti Aayog Best practice compendium

Best Practices Across India in Participatory Groundwater Management

CASE STUDY -04 – **Participatory irrigation management in Uttar Pradesh**

- **Place of Implementation:** Tarapur, Amethi, Uttar Pradesh
- **Agency:** Tarapur Alpika Committee (Water User Association [WUA])
- **Year of Implementation:** 2009
- **Background**
  - Post the enforcement of the Uttar Pradesh Participatory Irrigation Management Act, 2009, WUAs started managing the irrigation of agricultural fields.
- **Objective**
  - **To produce more crop per drop using judicious water irrigation practices.**

Best Practices Across India in Participatory Groundwater Management

CASE STUDY -04 – Participatory irrigation management in Uttar Pradesh

Interventions

- **Gradual reduction of malpractices** such as **illegal waterlifting and canal formation.**
- **Monetary contributions** by farmers.
- **Widening of service roads** along canals.
- **Canals were created to improve irrigation**.

Outcomes

- **Irrigation area** increased from **123 ha in 2011 to 386 ha** to date.
- The problem of tail feeding was solved through **water provision**.
- Silt removal, canal cutting, and cleaning resulted in improved water provision.
- **Reduction of malpractices** of illicit irrigation, water-lifting and canal formation.

Source: Niti Aayog Best practice compendium

Best Practices Across India in Participatory Groundwater Management

CASE STUDY -05 – COMMUNITY LED SPRINGSHED MANAGEMENT, Uttarakhand

Source:https://hi.wikipedia.org/wiki/%E0%A4%95%E0%A5%81%E0%A4%AE%E0%A4%BE%E0%A4%8A%E0%A4%81_%E0%A4%AE%E0%A4%A3%E0%A5%8D%E0%A4%A1%E0%A4%B2

- **Place of Implementation:** Kumaon Region, Uttarakhand
- **Agency:** Central Himalayan Rural Action Group (CHIRAG), ACWADAM, Arghyam
- **Year of Implementation:** 2013–17
- **Background**

- However, **fluctuations in weather patterns** over time have **led to a significant decline in spring flows**.
- **Perennial springs have turned seasonal** and in some unfortunate instances **dried up completely**.
- **Changes in land use patterns** and improper sanitation have also contributed to the deteriorating quality of spring water.
- **CHIRAG implemented a participatory groundwater management (PGWM) approach** for spring shed management in the Kumaon region, with support of Arghyam.

Source: Niti Aayog Best practice compendium

Best Practices Across India in Participatory Groundwater Management

CASE STUDY -05 – COMMUNITY LED SPRINGSHED MANAGEMENT, Uttarakhand

Objectives

- **To revive and protect springs, thereby ensuring water security in two villages, Kulgarh and Basgaon.**

Interventions

- **Community mobilization and awareness**
- **Hydrogeological mapping**
- **Hardware intervention**
- Promoting **efficient water use** through **protocols and conflict resolution**

Outcomes

- With the intervention, **Spring water was available** even in the lean season despite low rainfall.
- The **creation of Jal Samitis** has **empowered women** and developed a core group of women leaders.
- The community **enforces protocols, takes up Operation & Maintenance of structures, of springs.**

Jal Samiti Members-Kulgarh Village

A woman fetches water from a spring at Tula Kote village in the Kumaon hills

Source: Niti Aayog Best practice compendium

Best Practices Across India in Groundwater Resource Management

Case Study -06 - Pani Panchayat : Orissa Water Resource Consolidation Project

- **Place of implementation:** Orissa
- **Implementation agency:** Department of Water Resource Orissa
- **Objectives**

- **Primary Objective:-** **To improve the planning and development process** for the state's water resource; **thus increasing the overall agricultural productivity.**

- **To promote and secure equitable distribution of water** among its users, adequate maintenance of irrigation system, efficient and economical utilization of water to in accordance with the water budget and the operational plan.

Source:https://www.downtoearth.org.in/coverage/bureaucracy-restricts-potential-of-orissas-ipanii-panchayats-5955

Best Practices Across India in Groundwater Resource Management

Case Study -06 - Pani Panchayat : Orissa Water Resource Consolidation Project

Interventions

- **Well-defined institutional framework.**
- **"The Odisha Pani Panchayat Act-2002"** enforced in the state since late 2002.
- **"The Odisha Pani Panchayat Rules" 2003** enforced since 2003.
- Prior to enforcement of Pani Panchayat Act & Rules, Pani Panchayats were registered.

Outcomes

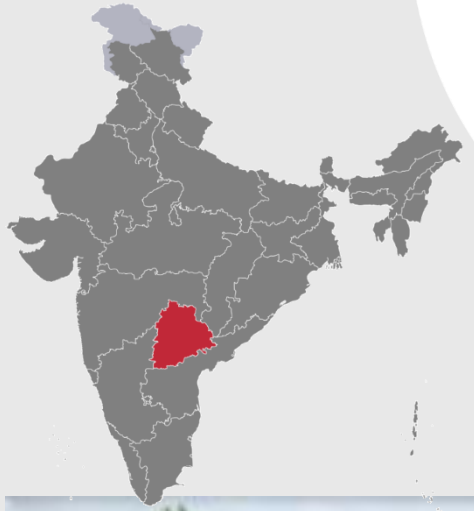
- The success stories published in "Krush **exchange of knowledge with larger audience**.
- Bottom-up ak Bandhu Arnapurna" Published helps in **sustained and effective management of the resource.**
- **Capacity development** helps in **continual improvement.**

Source:-https://www.gaonconnection.com/desh/world-water-day-pani-panchayat-member-women-pond-water-mahila-samakhya

Source:https://www.indiatoday.in/magazine/nation/story/20210329-rise-of-the-pani-panchayats-1781271-2021-03-20

Best Practices Across India in Groundwater Resource Management

Case Study -07 – Mission Kakatiya, Telangana



- **Place of implementation:** Telangana
- **Implementation agency:** Telangana State Government
- **Intervention**

- **Aimed at restoring minor irrigation sources of water like ponds and tanks.**
- The objective is to **enhance the development of agriculture based income for small and marginal farmers.**
- Done by **development of MI infrastructure, strengthening community based irrigation management**.

Source: : http://missionkakatiya.cgg.gov.in/

Best Practices Across India in Groundwater Resource Management

Case Study -07 – Mission Kakatiya, Telangana

➢ Components of Mission Kakatiya

1. **Silt Removal & Silt Application**
2. **Restoration of Feeder Channel to the tank**
3. **Repairs to Bund, Weirs & Sluices**
4. **Re-sectioning of Irrigation Channels & Repairs to CM & CD Works**
5. **Raising of FTL, Wherever possible/necessary**

➢ Takeaways

- **Public participation** will lead to ownership and **help in long-term sustainability**.
- **Restoration and maintenance of water resources should be a continual process** and local people should be trained to manage their resources.

Source: : http://missionkakatiya.cgg.gov.in/

Best Practices Across India in Groundwater Resource Management

Case Study -07 – Mission Kakatiya, Telangana

Video Source: https://www.youtube.com/watch?v=yPBOSirX9tY&t=334s

Case Studies/ Best Practices – Haryana Specific

Best Practices in Agriculture for Atal Bhujal Haryana

Wheat Cultivation through Zero Tillage Machine with Integrated Pest & Nutrient Management (IPNM).

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

Video Source:- https://www.youtube.com/watch?v=FIXoJh-FZXM

Best Practices in Agriculture for Atal Bhujal Haryana

Sugarcane Cultivation through Broad Bed Furrow (BBF) method with Drip irrigation System

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

Video Source:-https://www.youtube.com/watch?v=F1QkYDkzP78

Best Practices in Agriculture for Atal Bhujal Haryana

Promotion of Agroforestry (Block/Bund Fruits/Timber Plantation).

Promotion of -SWAR (System of Water for Agriculture Rejuvenation) Drip System under vegetable & orchards at Rainfed Areas.

Establishment of Vermicompost Unit for the preparation of qualitative vermicompost.

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

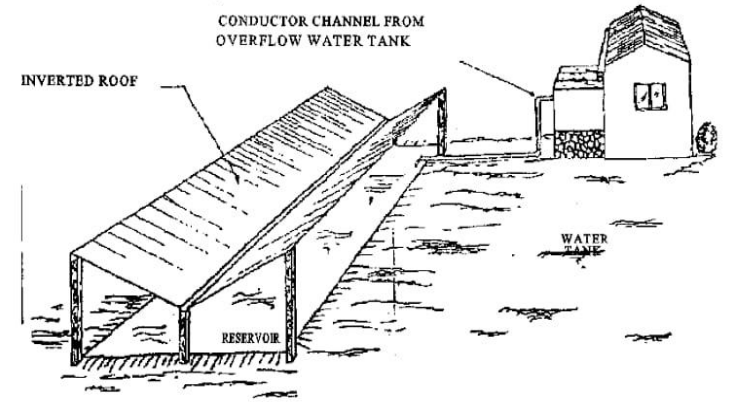
Best Practices in Agriculture for Atal Bhujal Haryana

Afforestation through Miyawaki Method

Source: http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf
Video Source:- https://www.youtube.com/watch?v=XI1CUPnGOaY

Best Practices in Agriculture for Atal Bhujal Haryana

Paddy Cultivation through DSR (Direct Seeded of Rice) Method



In situ water harvesting: recharge pits, farm ponds, etc.

Micro Irrigation and crop diversification

Atal Bhujal Yojana Haryana: Case Study

- **Case Study 1 : GP – Teharki, block Palwal, District Palwal**

➢ **Title : An attempt to increase irrigated area through micro irrigation instead of flood irrigation.**

➢ **Category: Agriculture**

➢ **Background:**

- Palwal is located in the southern part of Haryana and the western part of India, being a part of the National Capital Region.

➢ **Initiative:**

- After the launch of Atal Bhujal Yojana in the state, the projects related to **implementation of sprinkler, drip on subsidy, to farmers ,** were approved by the Village Water and Sanitation Committee.

Source: Atal Bhujal Yojana Haryana

Atal Bhujal Yojana Haryana: Case Study

- **Key Result/ Insight /Interesting Facts:**

- All these **component** sprinklers, drip and water carrying pipes **has been increased tremendously by the same availability of irrigation water** and their sources.
- **An awareness camp was organized** in every gram panchayats for adaptation of water efficient practice for increasing cost efficient ratio

➢ **Impact:**

- Total **irrigation efficiency will be increased by 2 to 2.5 times**.
- This increased area **can produce 2 to 2.5 times of previous production** and thereby **increased income to the farmers.**

Source: Atal Bhujal Yojana Haryana

Atal Bhujal Yojana Haryana: Case Study

Case Study 2 : GP – Mahrampur, Block Narnaul, District Mahendragarh.

- **Title :** The irrigation department of Mahendragarh district **has tried to connect the canal to the village pond for ground water recharge.**
- **Category:** **Agriculture and Livestock**
- **Background:** Mahrampur Gram Panchayat is located in Narnaul Block of Mahendragarh.
- **Challenges:**

- Due to **over-exploitation of groundwater** from generation to generation, the level of groundwater has gone down considerably, due to which the villagers and farmers are facing ground water crisis.
- There is a river in the villages which is known as Dohan river which is a rainy river and due to lack of rain, most of the river's pool remains dry.

Source: Atal Bhujal Yojana Haryana

Atal Bhujal Yojana Haryana: Case Study

➢ Initiative:

- Under the Atal Bhujal Yojana, the irrigation department of Mahendragarh district has **tried to connect the canal to the village pond for ground water recharge.**

- **There is a gap of three kilometres between the canal and the river**. The place where the river water is released into the pond is called Dochana Distributary and after the water comes into the pond.

➢ Impact:

- According to the villagers, due to the linking of the canal with the river, there has been **a significant increase in the ground water level**, as well as the **availability of water for agriculture and livestock**.

- This work has been done **through incentive amount under Atal Bhujal Yojana.**

Source: Atal Bhujal Yojana Haryana

Atal Bhujal Yojana Haryana: Case Study

Source: Atal Bhujal Yojana Haryana

Atal Bhujal Yojana Haryana: Case Study

- **Case Study 3 : GP – Nangal Kalia, Block Nangal Chaudhary, District Mahendragarh.**

➢ **Title : Ground water has increased through connecting the river with the canal.**

➢ **Category: Agriculture and Livestock**

➢ **Background:** Nangal Kalia village is located in Nangal Chaudhary block of Mahendragarh district

➢ **Challenges:**

- In Nangal kalia village **ground water level is very low.** Due to less water, farmers have **shifted their traditional crops to less water consuming crops**, as well as sprinklers are also being used in large quantities in agriculture.
- The wells have dried up and the water level in the bore well has gone down, due to which the amount of total dissolved solids in the water is increasing, which is affecting the health of the people and also the crops. Due to this **people have to depend on canal water**.
- **Krishnavati River,** which is the main river**, has also dried up**, due to which **many people are moving in the direction of migration.**

Source: Atal Bhujal Yojana Haryana

Atal Bhujal Yojana Haryana: Case Study

➢ Initiative:

- Village **water security plan** was prepared by the team of Atal Bhujal Yojna with the suggestion of the villagers, in which the **proposal of connecting the river with the canal was made by the villagers and farmers**, in which this proposal was approved by the Irrigation Department.

➢ Impact:

- At present, the **canal water is being released every 15 days into Krishnavati river bed from Naulpur distributary** in Nangal Kalia village, due to which the amount of ground water has increased significantly in the surrounding area, according to the local people.

Source: Atal Bhujal Yojana Haryana

Atal Bhujal Yojana Haryana: Case Study

Source: Atal Bhujal Yojana Haryana

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All India Institute of Local Self Government,
22, 23, D Block, Pankha Rd, D Block,
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Choose a suitable profile picture. Name yourself formally the way you would want to present yourself in actual meeting. Identify yourself when you speak.

VIDEO ON/OFF

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Always mute yourself while you are not speaking. Unmute yourself and speak only when it is your chance to speak.
BE POLITE, DO NOT INTERRUPT.

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MIND YOUR BODY LANGUAGE AND VOICE OF OPINION

Be attentive and a careful observer, you will be in direct sight of everyone. Come in with additional insights to add value to the conversation.

KEEP YOUR QUESTION MINIMAL AND ON THE TOPIC

Questions or queries to resource person, facilitator or fellow participants should be sent using CHAT option or raise your hand. Be straightforward and time conscious.

BE PREPARED FOR TECHNICAL DIFFICULTIES

In case of voice issues, leave the meeting and join again by call/dial into the meeting platform for audio clarity. In case of technical glitches, be prepared to cover unforeseen events that could happen.

DON'T LEAVE THE MEETING WITHOUT INFORMING THE HOST

Thank the facilitator/host/speaker before leaving the meeting.

ATAL BHUJAL YOJANA

Sustainable Ground Water Resource Management

Learning Duration- 3 Hours

Training Programme

Phase-II

Module Overview

The following will be covered

01 Goals, Key Components and Key performance indicators under Atal Bhujal Yojana

02 Monitoring and Evaluating the effectiveness of Groundwater Management Strategies

03 Role of Stakeholders and Strategies for effective stakeholder engagement

04 Case Examples & Best Practices under groundwater management

05 Innovative approaches for sustainable groundwater recharge and developing strategies for scaling up ABHY interventions

Session Overview

SL. No.	Session no	Topic	Sub Topic	Time (in Min)
1	Session 1	**Goals, Key Components and Key performance indicators under Atal Bhujal Yojana**	Goals of Atal Bhujal Yojana	5 mins
			Key Components of Atal Bhujal Yojana	10 mins
			Identifying key performance indicators (KPIs) to measure the impact of ABHY.	10 mins
2	Session 2	**Monitoring and Evaluating the effectiveness of Groundwater Management Strategies**	Monitoring of Groundwater Management Strategies	10 mins
			Evaluation of Groundwater Management Strategies	10 mins
			Groundwater Resource Management	5 mins
BREAK				15 mins
3	Session 3	**Role of Stakeholders and Strategies for effective stakeholder engagement**	Recap of the Previous Session	5 mins
			The role of stakeholders in Atal Bhujal Yojana Implementation	20 mins
			Strategies for effective stakeholder engagement and community Participation	15 mins

Session Overview

SL. No.	Session no	Topic	Sub Topic	Time (in Min)
4	Session 4	**Case Examples & Best Practices under groundwater management**	Recap of the Previous Session	5 mins
			Case Examples under Atal Bhujal Yojana Implementation	20 mins
			Best Practices in Haryana under ABHY implementation	10 min
5	Session 5	**Innovative approaches for sustainable groundwater recharge and developing strategies for scaling up ABHY interventions**	Promoting innovative approaches for sustainable groundwater recharge and use	20 min
			Developing strategies for scaling up ABHY interventions	15 min
			End note	10 mins

Promoting Innovative Approaches for sustainable groundwater recharge and use

Session - 5

Promoting Innovative Approaches for sustainable groundwater recharge and use

Sustainable groundwater recharge and use are crucial for maintaining water resources and meeting the increasing demands for water. Innovative approaches are continually being developed to enhance groundwater recharge and optimize its use. Here are some examples of innovative approaches for sustainable groundwater recharge and use:

- Managed Aquifer Recharge (MAR)
- Rainwater Harvesting
- Artificial Recharge Systems
- Conjunctive Use of Surface Water and Groundwater
- Managed Groundwater Extraction
- Water Conservation and Demand Management
- Groundwater Banking
- Innovative Water Treatment Technologies
- Data Monitoring and Modeling

Managed Aquifer Recharge (MAR)

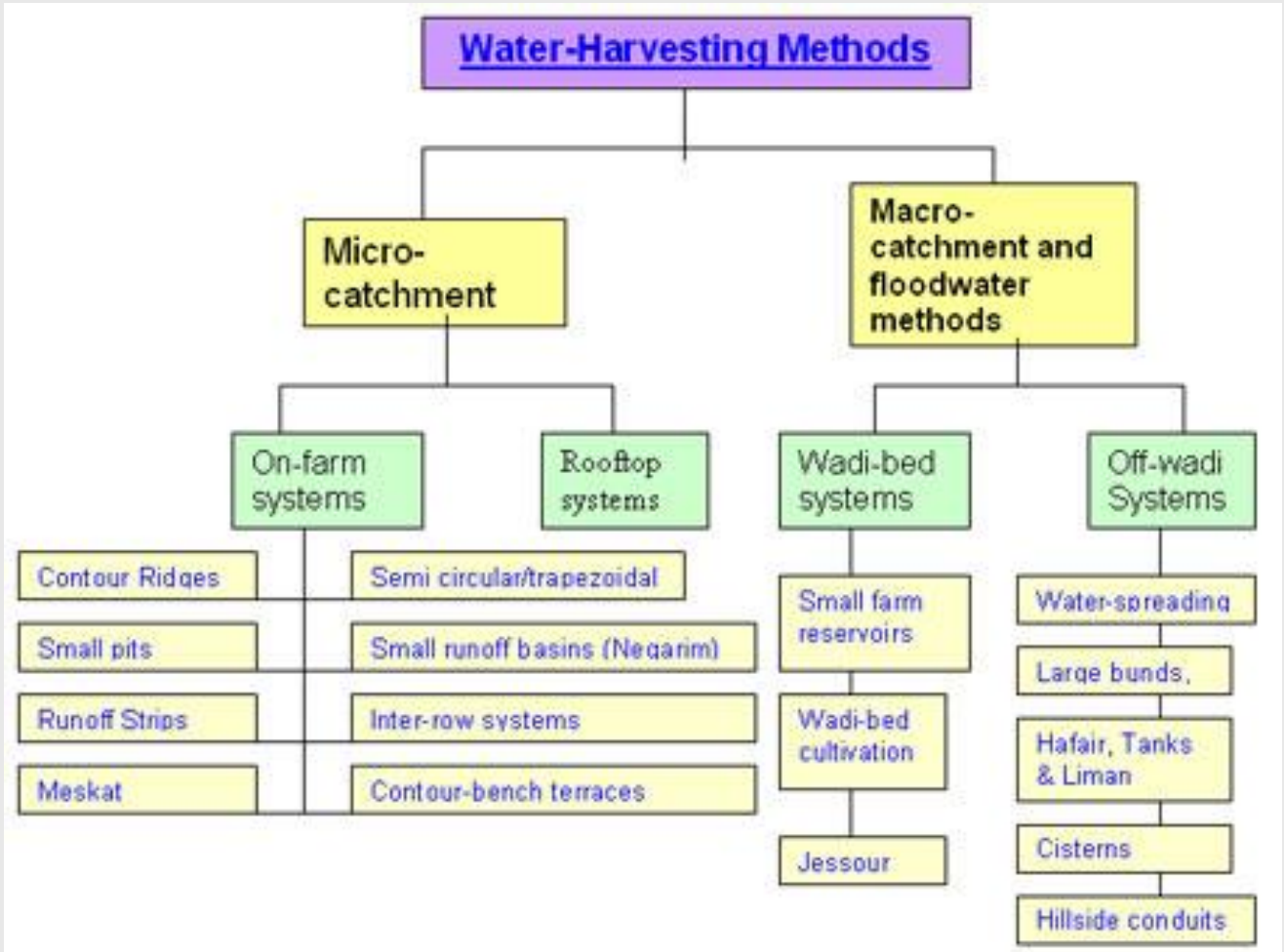
MAR involves purposeful recharge of surface water or treated wastewater into aquifers for later use. It can be accomplished through various methods, such as infiltration basins, recharge wells, injection wells, or spreading grounds. MAR helps replenish depleted aquifers, mitigate groundwater overdraft, and improve water storage capacity.

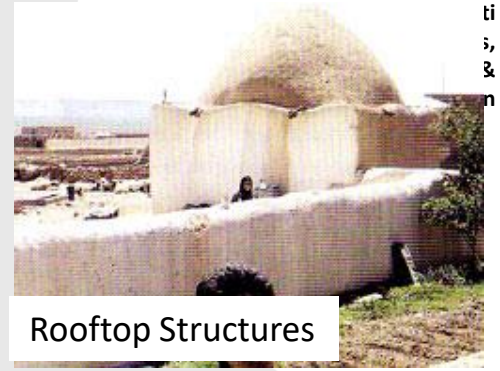
Benefits of Managed Aquifer Recharge (MAR):

- Replenishing Depleted Aquifers
- Drought Resilience
- Water Supply Augmentation
- Improving Water Quality
- Protection of Ecosystems
- Conjunctive Use of Water Resources
- Climate Change Adaptation
- Wastewater Reuse
- Urban Stormwater Management
- Water Conservation and Efficiency

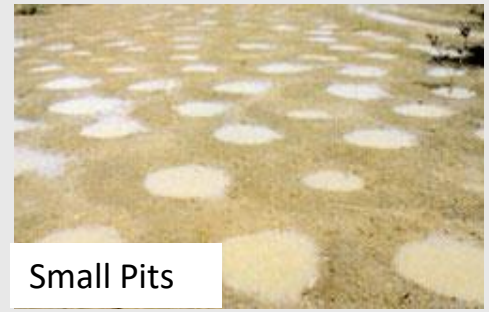
Rainwater Harvesting

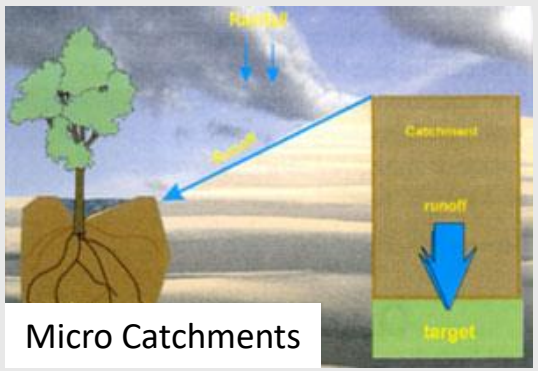
Capturing and storing rainwater from rooftops, roads, and other surfaces can directly recharge groundwater. Techniques like rainwater harvesting systems, such as rooftop collection, check dams, and recharge pits, allow rainwater to percolate into the ground, replenishing the aquifer and reducing runoff.




Rooftop Structures

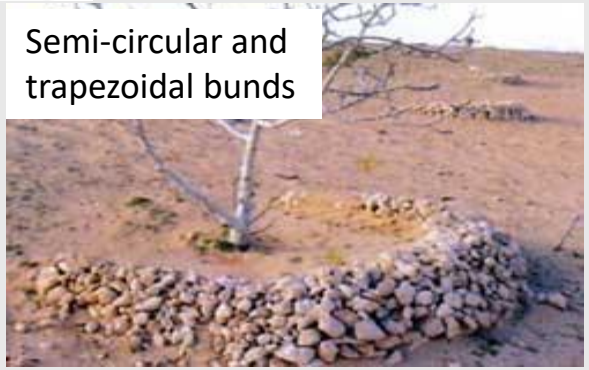

Inter-row systems


Small Pits



Micro Catchments


Contour Ridges


Semi-circular and trapezoidal bunds

Artificial Recharge Systems

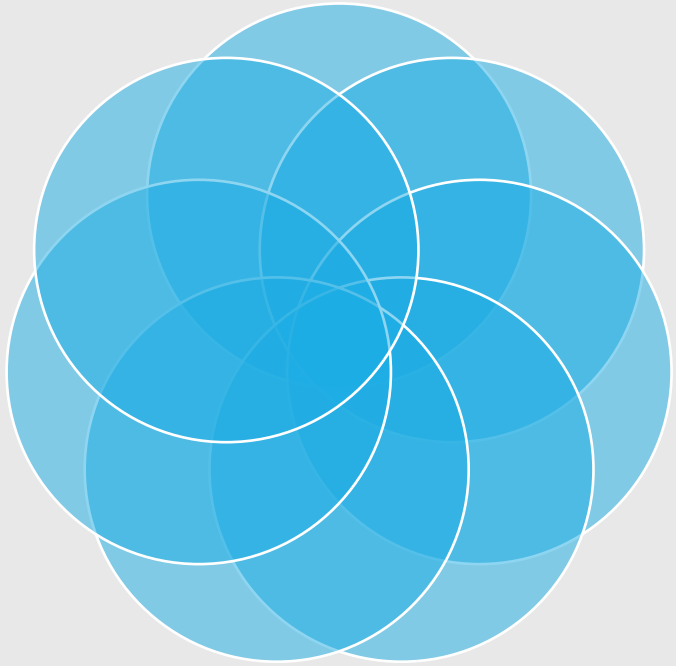
These systems enhance natural groundwater recharge by creating infrastructure to capture and channel excess surface water to suitable recharge areas. They can include constructed wetlands, percolation ponds, or subsurface injection methods to facilitate water infiltration into the groundwater system.

Conjunctive use of Surface Water and Groundwater

Integrated management of surface water and groundwater resources involves optimizing the use of both water sources based on their availability and characteristics. This approach aims to balance withdrawals, reduce reliance on groundwater during wet periods, and strategically use surface water for non-potable purposes, allowing groundwater to recharge.

Complementarity of Surface Water and Groundwater

Water Quality Improvement



Seasonal Storage and Buffering

Environmental Benefits

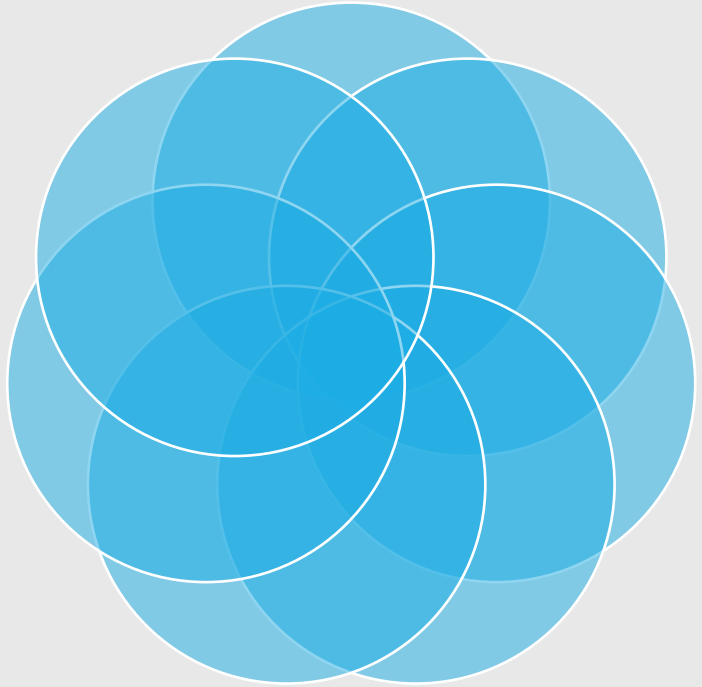
Drought Mitigation and Water Security

Flexibility and Flexibility and Adaptability

Enhanced Water Supply Reliability

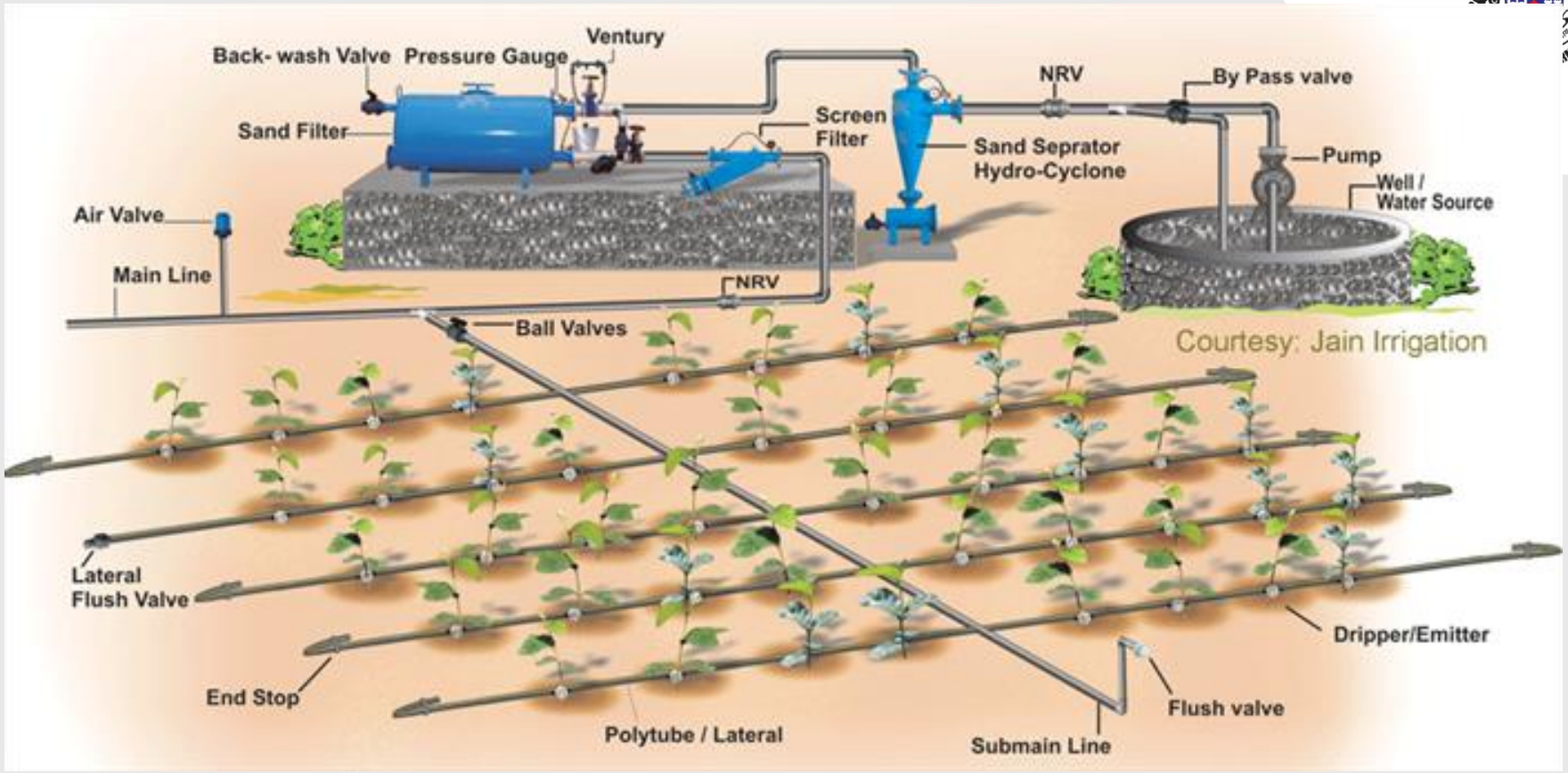
Managed Groundwater Extraction

Implementing sustainable pumping practices, such as optimizing well locations, controlling pumping rates, and using energy-efficient pumping systems, can help reduce the rate of groundwater depletion and promote sustainable use.



Water Conservation and Demand Management

Promoting efficient water use practices, implementing water conservation measures, and adopting demand management strategies can help reduce the overall demand for water, alleviating pressure on groundwater resources.



Water Conservation and Demand Management Video

Groundwater Banking

- Groundwater banking involves storing excess surface water in aquifers during wet periods for later use during dry periods. It effectively utilizes the underground storage capacity of aquifers, allowing for more efficient water management and resilience to drought conditions.

- It's important to note that the success of groundwater banking depends on **careful site selection, hydrogeological assessments, and regulatory frameworks.** Groundwater banking projects require **proper planning, monitoring, and management to ensure sustainable extraction and avoid negative impacts on the aquifer and surrounding ecosystems**

- Storage of Surplus Water
- Drought Resilience
- Water Supply Flexibility
- Environmental Benefits
- Water Quality Improvement
- Water Banking Partnerships
- Conjunctive Use of Water Sources

Innovative Water Treatment Technologies

Developing and implementing advanced water treatment technologies can improve the quality of alternative water sources, such as reclaimed wastewater or brackish groundwater, making them suitable for recharge or direct use. This expands the available water resources and reduces the reliance on traditional freshwater sources.

Innovative Water Treatment Technologies

1. Solar-powered Water Treatment Systems
2. Membrane Filtration
3. Electrochemical Treatment
4. Advanced Oxidation Processes (AOPs)
5. Hybrid Treatment Systems
6. Nanotechnology-based Treatment
7. Biofiltration and Phyto-remediation
8. Decentralized and Portable Water Treatment Systems

Strategies for scaling up ABHY interventions

Strategies for Scaling up Atal Bhujal Yojana Interventions

Atal Bhujal Yojana (ABHY) is a government initiative in India aimed at sustainable management of groundwater resources. Scaling up ABHY interventions involves expanding the reach and impact of the program to cover a larger geographic area and a greater number of stakeholders. Here are some strategies for scaling up ABHY interventions

1. Comprehensive Stakeholder Engagement
2. Awareness and Capacity Building
3. Institutional Strengthening
4. Policy and Regulatory Support
5. Financial Resources and Investment
6. Replicating Successful Models
7. Technological Solutions and Innovation
8. Monitoring and Evaluation
9. Knowledge Sharing and Learning Networks
10. Phased and Area-specific Approach

Learning Resources

Scan the QR code to access Atal Bhujal Guidlines
or Website http://jalshakti-dowr.gov.in/sites/default/files/Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf

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