



VILLAGE ADHYAN

Toolkits for Community Engagement and Rural Transformation

Toolkit Series - 2

Rural Infrastructure

Unnat Bharat Abhiyan (UBA)

SEG-Capacity Building, Strategy for Convergence
and Implementation of Various Govt. Schemes



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Preface

Village Adhyan Toolkits: Connect the Dots to Find the Flow

The **Village Adhyan Toolkits** are designed as **practical field guides** for learners engaging with villages. They are not meant to be read like an academic manual, but to be *used*—during field visits, community interactions, and reflection. From the outset, this series makes a deliberate choice: *perceived usability matters more than intellectual completeness*. The purpose is to support learning that actually happens on the ground.

Village Adhyan treats field learning as one journey supported by many pocket guides. No one carries an atlas into a village; they carry only the route needed for the day. In the same spirit, this Toolkit is arranged as **seven Learning Series**, each focusing on a distinct theme of village life, yet connected to the larger whole.

Each toolkit is modular, focused, and field-friendly, helping the learner clearly answer:

- *What shall I do with this toolkit?*
- *What should I observe?*
- *What should I ask?*
- *What should I reflect on?*

The likely insights at each stage are presented as **concise nuggets**, meant to be retained as **mental models**—simple ways of seeing connections, patterns, and flows in village realities.

Instead of a single bulky compendium, Village Adhyan is intentionally designed as a **Toolkit Series**. In a way, it works like a Netflix series rather than an 800-page textbook. Learning is broken into focused “episodes” that can be taken up one at a time, revisited when needed, or even skipped depending on context. This makes each toolkit psychologically approachable, clearly finishable, and easy to share, print, or update.

By presenting Village Adhyan as seven Learning Series—with a common structure and flow—the toolkits reduce cognitive load and invite use rather than hesitation. The pages that follow explain how each Learning Series supports this journey of exploration, helping learners gradually see villages not as isolated problems, but as interconnected systems.

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Village Adhyan Toolkit – 2

Rural Infrastructure Development

Understanding Rural Infrastructure

In everyday language, we often say: “*The road is poor,*” “*The school has no separate toilets for girls,*” “*The Facilities in this PHC are inadequate,*” “*People are not getting enough water.*” These statements point to infrastructure, which forms the physical foundation on which rural life, services, and development outcomes depend.

However, rural infrastructure is not just about the presence of buildings, roads, or pipes. It is about whether these facilities are:

- (i) available,
- (ii) functional,
- (iii) accessible,
- (iv) adequate,
- (v) and capable of delivering [capacity to deliver] services to the people who need them.

What is Rural Infrastructure?

Rural infrastructure refers to the physical facilities and systems that enable essential services such as:

- Education (schools, anganwadis)
- Health (sub-health centres, PHCs)
- Drinking water and sanitation
- Roads and transport
- Electricity and energy
- Digital connectivity
- Financial and market access
- Panchayat and community institutions

Infrastructure becomes meaningful only when it supports service delivery — education, health care, water supply, sanitation, mobility, communication, and livelihoods. These infrastructures are meant *to deliver certain services such as drinking water service delivery, sanitation service delivery, health services, educational etc.*

A Simple Mental Model for Understanding Rural Infrastructure

Rural infrastructure can be understood as a flow, not as isolated assets:

Infrastructure → Capacity → Services → Outcomes → Sustainability

1. Infrastructure (What exists physically?)

This refers to the availability of physical facilities:

- Buildings (schools, PHCs, anganwadis, GP offices)
- Roads, streetlights, playgrounds
- Water supply systems, toilets
- Electricity and digital networks

But availability alone is insufficient. A school building without toilets, or a water system without regular supply, cannot deliver its intended service.

2. Capacity (What can the infrastructure actually handle?)

Capacity answers the question:

“How much service can this infrastructure deliver effectively?”

Capacity includes:

- Design capacity (e.g., number of students per classroom, litres of water per day)
- Manpower (teachers, health workers, pump operators)
- Skills and systems (maintenance, management, governance)

An infrastructure facility may exist but still be overloaded, understaffed, or poorly managed by untrained staff leading to weak service delivery.

3. Services (What actually reaches people?)

Service delivery refers to:

- Education delivered by schools
- Health care delivered by PHCs
- Drinking water delivered through taps
- Transport service delivered through roads and buses

- Digital services delivered through connectivity

This is the last-mile reality, where policy meets daily life.

Infrastructure is only successful if services are regular, adequate, reliable, equitable, safe, and accessible.

4. Outcomes (What difference does it make?)

Outcomes reflect how infrastructure improves lives, such as:

- Better learning outcomes
- Improved health and nutrition
- Reduced drudgery for women
- Safer drinking water provision
- Improved access to markets and jobs

Here, infrastructure shifts from being a physical asset to a *development enabler*.

5. Sustainability & Future Readiness (Will it last?)

Infrastructure must be:

- Financially sustainable (O&M costs covered)
- Institutionally managed (clear roles and responsibility)
- Technically resilient (climate-resilient, scalable)
- Socially accepted (used, protected, and valued)

This determines whether infrastructure supports long-term development goals, including SDGs and Viksit Bharat 2047.

It reinforces a key idea:

Rural development does not happen because infrastructure exists, but because infrastructure works, delivers services, and improves lives sustainably.

One-Line Mental Model to Remember

Rural infrastructure is not about what is built, but about what services it enables, for whom, how well, and for how long. Infrastructure → Capacity → Services → Outcomes → Sustainability

For Example: Rural Drinking Water Supply – A Study Checklist

(From Source to Sustainability)

A. Resources & Infrastructure (What exists?)

Study questions

- What are the drinking water sources in the village? (groundwater, surface water, springs)
- Are sources perennial or seasonal?
- Is there adequate storage capacity?
- What percentage of households have tap connections?
- Are public buildings (schools, anganwadis, GP office) connected?

Typical gaps

- Sources dry up in summer
- Infrastructure exists but is incomplete or poorly designed

Scheme leverage

- JJM (in-village infrastructure, source strengthening incorporate in the GPDP)
- MGNREGS (water source recharge, desilting, RWH structures)
- SBM-G and MGNREGS convergence for grey water management (recycling and reuse)

B. Systems & Institutions (Who manages it?)

Study questions

- Is a Village Water & Sanitation Committee (VWSC) formed and active?
- Are roles of GP, VWSC, and line departments clearly defined?
- Is there a written O&M arrangement?
- Are women adequately represented in decision-making?

Typical gaps

- VWSC exists only on paper
- No clarity on responsibility for repairs and payments

- There are no operational rules nor the Operation and Maintenance Policy implemented.

Scheme leverage

- JJM (institution building, training of VWSC, VWSC support, IEC campaigns)
- XV Finance Commission grants (O&M support)

C. Service Delivery & Functionality (What actually reaches people?)

Study questions

- Is water supplied daily? For how many hours?
- Is pressure adequate at tail-end households?
- Are taps functional throughout the year?
- Are breakdowns repaired quickly?

Typical gaps

- “Har Ghar Jal” on records, but irregular supply
- Long downtime during breakdowns

Scheme leverage

- JJM (functionality norms, service delivery standards)
- GP untied funds / XV FC for minor repairs

D. Water Quality & Safety (Is the water safe?)

Study questions

- Has 100% water quality testing been done using FTKs?
- Are there contamination issues (fluoride, iron, salinity, bacteriological)?
- Are results shared with the community?
- Are mitigation measures in place?

Typical gaps

- Testing done, but results not acted upon
- Safe sources available but not connected

Scheme leverage

- JJM (FTKs, quality monitoring, mitigation works)
- PHED – Public Health Engineering Department (surveillance, awareness)

E. Household Use & Behaviour (How is water actually used?)**Study questions**

- Do households use tap water for drinking or still rely on old sources?
- Is water used judiciously or wasted?
- Is water available for hygiene and sanitation needs?
- Are there seasonal conflicts over water use?

Typical gaps

- Infrastructure provided, behaviour unchanged
- Water scarcity due to misuse or overuse

Scheme leverage

- JJM (IEC, BCC activities)
- SBM-G (water for sanitation and hygiene linkage)

F. Financial Sustainability (Who pays, who maintains?)**Study questions**

- Is any user charge collected?
- Is there a separate water O&M fund?
- Are electricity and operator costs covered?
- Are accounts transparent?

Typical gaps

- No user contribution → system collapse
- Dependence only on government funds

Scheme leverage

- JJM (O&M cost norms)
- XV Finance Commission grants
- GP own-source revenue mechanisms

G. Convergence with Other Schemes (Does water support other outcomes?)**Study questions**

- Are MGNREGS works used for recharge of drinking water sources?
- Is greywater reused for kitchen gardens or plantation?
- Are water plans linked to sanitation and livelihoods?
- Is water budgeting done at GP level?

Typical gaps

- Schemes working in silos
- Water supply stressed due to lack of recharge

Scheme leverage

- MGNREGS (NRM works)
- SBM-G (greywater management)
- GP planning processes

H. Equity & Inclusion (Who is left out?)**Study questions**

- Do SC/ST hamlets and remote habitations get equal supply?
- Are women and elderly facing access issues?
- Are migrant or landless households covered?

Typical gaps

- Tail-end and marginalised households underserved

Scheme leverage

- JJM (last-mile connectivity focus)
- GP planning and grievance redressal mechanisms

I. Future Readiness & Sustainability (Will it work in 10–20 years?)**Study questions**

- Is the source climate-resilient?
- Is water demand increasing?
- Are youth trained in system operation?
- Is there a long-term water security plan?

Typical gaps

- Short-term solutions without sustainability thinking

Scheme leverage

- JJM (Village Action Plans, source sustainability)
- MGNREGS (long-term water conservation works)

How a Student Uses This Checklist

1. Observe infrastructure and service delivery
2. Interview households, VWSC members, GP leaders
3. Identify gaps under each section
4. Map gaps to schemes (not new programmes)
5. Suggest corrective actions using convergence

One-line Mental Model Reminder

Drinking water problems are rarely about pipes alone—they are about resources, systems, behaviour, and sustainability working together.

Rural Drinking Water Supply: A Computer Science Student's Perspective

1. Understand the Rural Water Problem (Domain Context)

Key realities

- Water supply is intermittent, not 24×7
- Failures happen due to pump breakdowns, low source yield, power cuts
- Water quality issues are often detected late
- Data is mostly manual or estimated/ Scheduling done manually or not done at all
- Any vulnerable spots in the pipeline unknown until breakdown occurs
- Any breakdown in pipeline away from the eyes of the Pump Operator might cause water not reaching one section of the village.
- Level of residual chlorine in water unknown – may differ at head-end and tail-end
- There are no alerts about preventive maintenance

Student mindset shift

The problem is not lack of infrastructure alone, but lack of real-time information.

2. Identify What Needs Monitoring (Problem → Data Mapping)

Rural Issue	What to Monitor	CS Concept
Tanks run dry unexpectedly	Water level in tanks	Level sensors
Pumps run too long or fail	Pump status & runtime	Actuators + logs
Unequal water supply	Flow in pipelines	Flow sensors
Unsafe water	Basic quality parameters	Sensor data
Delayed repairs	Fault alerts	Event triggers

3. Design a Simple IoT / SCADA Architecture

Basic components

- Sensors: water level, flow, pressure, basic quality
- Controller: Arduino / ESP32 / PLC
- Communication: GSM, LoRa, Wi-Fi (context-specific)
- Dashboard: Web or mobile interface
- Alerts: SMS / WhatsApp notifications

Core Computer Science contribution

- Data collection
- Data transmission
- Visualization
- Alert logic

4. Example Use-Cases a Student Can Build**Use Case 1: Smart Overhead Tank Monitoring**

- Live tank level displayed on dashboard
- Automatic pump ON/OFF logic
- Alerts when tank fails to fill

Use Case 2: Pump Health Monitoring

- Track daily pump runtime
- Detect abnormal patterns
- Prevent motor burnout

Use Case 3: Water Distribution Equity

- Compare flow at head and tail-end
- Identify leakages or blockages
- Support fair scheduling

5. Link Technology to Governance & Schemes

- Supports service delivery monitoring under Jal Jeevan Mission
- Helps Panchayats track functionality, not just assets
- Enables preventive maintenance using XV Finance Commission O&M funds

Important lesson for students

“Technology is an enabler, which can support local decision-making”.

6. Data → Decision → Action (Computer Science Thinking Applied)

Sensor Data → Threshold Check → Alert → Human Action

Example

- Tank level < 30% → Alert operator
- Pump runs > normal time → Maintenance call
- No flow detected → Leak investigation

7. Ethical & Practical Concerns (Very Important)

Students must consider:

- Cost and affordability
- Maintenance capability at village level
- Power and network reliability
- Simplicity over sophistication

A working ₹5,000 solution is better than a ₹50,000 unused system. Make it cost effective so that it will be practical for a GP to be able to implement.

8. What a Student Can Submit as Output

- Problem statement linked to rural water supply
- System architecture diagram
- Prototype or simulation
- Dashboard screenshots
- Short note on how it helps service delivery

One-Line Framing for a Computer Science Student

IoT and SCADA help rural water supply by making invisible problems visible in real time.

Rural Drinking Water Supply: A Chemistry Student's Perspective

1. Understand the Rural Water Quality Problem

Ground reality

- Water may be available, but not safe
- **Common rural issues:**
 - Fluoride, iron, salinity, arsenic
 - Microbial contamination
 - Seasonal variation in quality
- Problems are often invisible (no colour, smell, or taste)

Chemistry student's role

Water safety is fundamentally a chemical and analytical problem.

2. Identify Key Water Quality Parameters (Chemistry Mapping)

Rural Issue	Chemical Parameter	Chemistry Concept
Dental / skeletal fluorosis	Fluoride (F^-)	Ionic concentration
Iron staining, bad taste	Iron (Fe^{2+} / Fe^{3+})	Oxidation states
Salinity	TDS, EC	Electrochemistry
Acidity / corrosion	pH, alkalinity	Acid–base chemistry
Health risk	Coliform bacteria	Water chemistry + hygiene

3. Water Sampling & Testing (Core Chemistry Skill)

Student activities

- Collect representative water samples
- Use Field Testing Kits (FTKs)
- Perform lab-based analysis (where possible)

Skills applied

- Sample handling
- Titration, colorimetry, electrode methods
- Interpretation against drinking water standards

4. Interpret Results Using Standards

Key task

- Compare test results with acceptable limits
- Classify water as:
 - Safe
 - Requires treatment
 - Unsafe for drinking

Learning insight

Chemistry converts raw measurements into health decisions.

5. Identify Treatment Options (Chemistry in Action)

Contamination	Chemistry-Based Solution
Fluoride	Adsorption, precipitation
Iron	Oxidation + filtration
Turbidity	Coagulation–flocculation
Microbial	Chlorination
Acidity	Neutralisation

Student learning

- Reaction mechanisms
- Dosage calculation
- Side-effects and limitations

6. Link Chemistry to Rural Programmes & Practice

Where this knowledge is used

- Water quality monitoring under Jal Jeevan Mission
- Source selection and mitigation planning
- Community awareness on safe water handling

Key insight

Chemistry supports evidence-based decisions, not guesswork.

7. Behaviour & Communication (Often Ignored, Very Important)

Student role

- Explain results in simple language
- Address myths (“clear water is safe”)
- Promote safe storage and handling

Chemistry + society: Scientific results must be understood by non-scientists.

8. Ethical & Practical Concerns

Students must consider:

- Cost and feasibility of treatment
- Simplicity of methods

- Waste disposal from treatment processes
- Long-term sustainability

9. Possible Student Outputs

- Water quality testing report
- Contamination map of a village
- Treatment recommendation note
- Awareness material based on findings

One-Line Framing for a Chemistry Student

Chemistry makes invisible water risks visible and helps convert unsafe water into safe drinking water.

Rural Drinking Water Supply: Perspective of an Electrical Engineering

1. Understand the Core Problem (Energy–Water Link)

Ground reality

- Rural water pumps depend heavily on grid electricity
- Power supply is irregular and voltage fluctuates
- Electricity bills are a major recurring cost for Gram Panchayats
- Pump failures often happen due to poor power quality

EE student's perspective: Drinking water problems are often energy problems in disguise.

2. Identify Where Electrical Engineering Fits

Water Supply Issue	EE Perspective
High power bills	Energy efficiency & renewables
Unreliable pumping	Power source design
Pump damage	Motor protection & control
Irregular supply	Automation & scheduling

3. Solar-Powered Pumping (Primary Application)

Core idea

- Replace or supplement grid power with solar photovoltaic (PV) systems

EE concepts applied

- Solar PV system sizing
- DC/AC motors and drives
- Inverters and motor controllers
- Load matching (pump–panel optimization)

Typical use

- Bore well pumps
- Intake pumps
- Overhead tank filling

4. Hybrid Systems: Solar + Wind (Advanced Option)

Why hybrid?

- Solar works best during daytime
- Wind can supplement during cloudy or night conditions
- The battery life of solar is doubled when it's hybrid (with mini-wind mill)

EE learning areas

- Hybrid power system design
- Charge controllers
- Energy storage (batteries)
- Power management logic

Hybrid systems improve reliability, not just savings.

5. Automation & Control (High-Value EE Contribution)

What can be automated

- Automatic pump ON/OFF based on tank level
- Dry-run protection
- Overload and voltage protection
- Scheduled pumping to reduce wastage

EE tools

- Sensors (level, current, voltage)
- Relays, contactors
- PLC / microcontroller-based control

6. Linking with Government Schemes (Very Important)

Relevant national support

- PM-KUSUM Scheme – solar pumps and decentralised solar power
- Renewable energy components supported through convergence with Jal Jeevan Mission.

Why this matters to students

Engineering solutions must be financially and institutionally viable, not just technically sound.

7. Simple Project Ideas for EE Students

- Solar-powered borewell pump with automatic tank filling
- Hybrid solar–wind pumping model (simulation or prototype)
- Energy audit of GP water supply system + solar retrofit plan
- Motor protection and efficiency improvement system

8. Practical Concerns (Engineering Reality Check)

Students must consider:

- Initial capital cost vs long-term savings
- Maintenance capability at village level

- Theft, vandalism, and safety
- Seasonal variation in energy generation

9. Expected Student Outputs

- Load calculation and system sizing
- Single-line electrical diagram
- Cost–benefit analysis (power bill savings)
- Recommendation note for Gram Panchayat

One-Line Framing for an EE Student

Electrical engineering helps rural drinking water systems by making pumping reliable, affordable, and energy-efficient through renewable power and smart control.

Rural Drinking Water Supply: Perspective of Commerce and Management Students

(B.Com, M.Com, MBA – Finance, Accounting, Public Administration, Management)

1. Understand the Core Problem (Finance, Not Just Engineering)

Ground reality

- Central Government (Ministry of Jal Sakthi) and State Governments (PHED / RWS) largely finance **capital expenditure (CapEx)** for creating rural water supply infrastructure under JJM:
 - Source creation
 - Pipelines
 - Storage tanks
 - Pumping infrastructure
- **Recurring costs are not funded fully or permanently**, such as:
 - Pump operator salaries
 - Electricity bills for pumping
 - Chlorination and minor consumables
 - Routine and breakdown maintenance

- These **Operation & Maintenance (O&M) costs must be borne locally** by:
 - Gram Panchayat
 - User community

Key insight for Commerce & Management students

Rural drinking water systems fail more often due to **weak financial management** than due to lack of infrastructure.

2. Identify the Cost Structure (CapEx vs OpEx Thinking)

Cost Category	Typical Items	Nature of Cost
Capital Expenditure	Pipes, pumps, tanks, treatment units	One-time
Operational Expenditure	Power bills, salaries, chemicals	Monthly / recurring
Maintenance Expenditure	Leak repairs, motor rewinding, valve replacement	Irregular but inevitable

Management lens

- CapEx is visible and politically attractive
- OpEx is invisible, recurring, and unpopular
- Sustainability depends entirely on **steady OpEx financing**

3. Revenue Side Analysis (Where Does the Money Come From?)

Potential revenue sources at GP level

- Water user charges (monthly / volumetric / flat rate)
- House tax and other Own Source Revenues (OSR)
- XV Finance Commission grants (partial support)
- Occasional State support (through State Finance Commission Funds / during crises)

Typical gaps observed

- User charges not collected or very low
- Political reluctance to enforce payments
- No earmarked (ring-fenced) O&M fund

- Revenue unpredictable, expenses fixed

Student insight: *A system with fixed costs and uncertain revenues is structurally fragile.*

4. Financial Behaviour of Households (Demand-Side Problem)

Observed household behaviour

- “Water should be free; government provides it”
- Willing to pay for:
 - Mobile recharge
 - Cable TV / TV Recharge
 - Packaged drinking water
 - Household (monthly) Electricity Bill
 - Two-wheeler (bike etc.) petrol and maintenance expenses
- Unwilling to pay for:
 - Community water system maintenance

Management interpretation

- Not a pure affordability issue
- It is a **value perception and incentive problem**
- Weak link between payment and service quality

5. Analyse Financial Sustainability at GP Level

Key study questions for students

- What is the annual O&M cost of the water system?
- How much revenue is actually collected?
- Is there a water-specific O&M account?
- How many months can the GP survive without collections?
- What happens financially when a major breakdown occurs?

Typical finding

One major repair can wipe out the GP's annual water budget.

6. Explore Third-Party O&M Models (PPP / Contracting Lens)**Possible options**

- Outsourcing O&M to:
 - Private operators
 - SHGs
 - Local entrepreneurs
- Annual maintenance contracts (AMCs)

Critical management challenge

- Third-party services require **assured payments**
- GP already running a financial deficit
- Risk of:
 - Contract failure
 - Service discontinuity
 - Disputes and blame-shifting

Student learning

In this case, outsourcing does not solve financial problems; it only **reallocates risk**.

7. Apply Financial Management Tools

Commerce & Management students can apply:

- Cost–benefit analysis of water supply models
- Break-even analysis for user charges
- Cash flow forecasting for O&M
- Sensitivity analysis (power tariff increase, pump failure)
- Pricing models:

- Flat tariff vs volumetric
- Generate and serve Quarterly Demand Notice for Water and Utility charges such as solid waste management charges (so that if / when such systems fail the households cannot blame Panchayat administration).
- Include water charges along with annual House Tax
- Cross-subsidy options

Key learning

Water supply is a public service, but it still follows basic financial laws. Moreover, Gram Panchayats are local governments. A '(local) government' cannot run without collecting any tax or user charges. Public utilities cannot function eternally unless users take responsibility.

8. Governance, Accountability & Transparency

Critical governance questions

- Are water accounts transparent and shared publicly?
- Do users see how their money is spent?
- Is there trust between GP and households?
- Are payment defaults socially accepted?

Management insight

Financial discipline improves when transparency and accountability improve.

9. Ethical & Practical Considerations

Students must recognise:

- Water is a basic need, not a commercial commodity
- User charges must be:
 - Affordable, Equitable, Justified by service quality
- Exemptions or subsidies may be needed for the poorest

Balance required

Financial sustainability without social exclusion.

10. Possible Student Outputs

- O&M cost–revenue gap analysis for a GP
- Sustainable user charge model proposal
- Financial risk assessment of a village water system
- Case study on payment resistance and recovery strategies
- Policy note on strengthening GP own-source revenues for water

Perspective – Students of Social Sciences / Psychology / Social Work

(Let's take a Behavioural Perspective)

1. Understand the Core Problem (Behaviour, Not Just Infrastructure)

Ground reality

In many villages:

- Water is wasted even when sources are scarce
- Drinking water is used for gardening, vehicle washing, or construction
- People believe water must be free of cost because “government provides it”
- During breakdowns, responsibility is shifted entirely to the GP or government
- User charges are resisted, even when systems fail due to lack of maintenance funds

Key insight for social science students

Drinking water problems are not only technical or financial problems — they are behavioural, institutional, and normative problems.

A tap connection changes access, but not automatically attitudes, norms, or responsibility.

2. Identify Typical Behavioural Patterns (What People Actually Do)

Observed Behaviour	Underlying Behavioural Explanation
“Water is unlimited” mindset	Low salience of scarcity
Resistance to paying user charges	Perception of water as an entitlement
Expecting instant repair by GP	Externalisation of responsibility
Overuse for non-essential purposes	Weak social norms & no peer sanctions
Poor care of public assets	Low sense of collective ownership

Student learning

Behaviour is shaped by:

- Beliefs (“Government will fix it”)
- Norms (“Everyone wastes water”)
- Incentives (No penalty, no reward)
- Past experience (Free schemes earlier)

3. Use a Simple Behavioural Lens (Behavioural Diagnosis)

Students can analyse rural water issues using three questions:

A. Capability

- Do people understand water scarcity and system limits?
- Do they know how breakdowns occur and what O&M costs are?

B. Opportunity

- Are there forums (Gram Sabha, VWSC meetings) to discuss water issues?
- Are transparent mechanisms available to collect and manage user charges?

C. Motivation

- Do people feel responsible for the system?
- Is there social recognition for good behaviour or social disapproval for misuse?

If behaviour does not change, infrastructure will collapse — repeatedly.

4. Study Behaviour at Household & Community Levels

What students can observe and document

- How households actually use tap water (drinking vs non-essential uses)
- Seasonal changes in water behaviour (summer vs monsoon)
- Differences across hamlets, caste groups, or economic classes
- Gender roles in water collection, storage, and conflict resolution

Methods students can use

- Household interviews
- Focus Group Discussions (FGDs)
- Observation at water points
- Gram Sabha meeting analysis
- Informal conversations (very important)

5. Identify Behavioural Gaps in Water Governance

System Aspect	Behavioural Gap
VWSC exists	People don't attend or engage
User charges decided	People don't see value in paying
Water rules framed	Rules not socially enforced
Breakdowns reported	No shared responsibility for prevention

Critical insight

Institutions fail not because they don't exist, but because people do not internalise them.

6. Behaviour Change Approaches Students Can Apply**A. Norms-Based Approaches**

- Make misuse socially visible (“This affects everyone”)
- Promote positive deviance (households who conserve water)

B. Framing & Messaging

- Shift from “*free water*” → “*shared village resource*”
- Shift from “*government duty*” → “*community-managed service*”

C. Collective Decision-Making

- Facilitate Gram Sabha discussions on:
 - When water can be used for non-drinking purposes
 - How much everyone should contribute
 - What happens when rules are violated

D. Responsibility Mapping

- Who reports leaks?
- Who authorises repairs?
- Who monitors misuse?

Behaviour changes when roles are clear.

7. Link Behaviour to Sustainability & Schemes

Behavioural insights support:

- Service sustainability under Jal Jeevan Mission
- Hygiene and water-use discipline under Swachh Bharat Mission (Gramin)
- Long-term O&M planning using GP and XV Finance Commission funds

Key student insight

No amount of funding can substitute for collective responsibility.

8. Ethical & Practical Considerations for Students

Students must be careful to:

- Avoid blaming communities
- Respect lived realities and poverty constraints
- Understand historical experience of “free schemes”
- Work with communities, not on communities

Behaviour change is slow, relational, and trust-based.

9. What a Student Can Produce as Output

- Behavioural diagnosis note for a village water system
- Case study on water misuse and collective response
- Community behaviour change strategy (simple, practical)
- Documentation of resistance and how it was addressed
- Reflection note linking behaviour to sustainability

One-Line Framing for a Social Science / Psychology Student

Rural drinking water systems fail not because people are careless, but because behaviour, norms, and responsibility are not aligned with infrastructure.

Step 1: What does “access” mean here?

A tap connection changes ‘access’, but not automatically attitudes, norms, or responsibility.

Access = physical availability

Earlier:

- People walked to a handpump or well
- Water was physically limited
- Effort itself controlled use

Now:

- Water comes through a tap at home
- Effort is near zero
- Quantity feels unlimited

So yes — access has changed.

Step 2: What are “attitudes”, in simple terms?

Attitude = what people believe

Example beliefs you’ll hear in villages:

- “Water comes from government”
- “It’s a right, not our problem”
- “If tap is there, water will come”
- “Paying for water is wrong”

These beliefs are not altered just because a pipe enters the house.

A pipe does not teach:

- Where water comes from
- What it costs to pump and repair

- Why misuse affects others

Step 3: What are “norms”? (This is the key)

Norm = what people think is “normal behaviour”

Examples:

- Everyone washes vehicles with tap water → becomes normal
- Everyone wastes water → no shame
- No one pays user charges → refusing payment feels justified

Norms are social, not technical.

A tap does not change what the community considers acceptable.

Step 4: What is “responsibility” in village terms?

Responsibility means:

- “If there is a leak, I must report”
- “If pump fails, we must contribute”
- “If someone misuses water, we must stop it”
- “This system belongs to us”

But what actually happens?

- People say: “GP will fix it”
- Or: “Government should repair”
- Or: “Why should I pay?”

So responsibility stays external, not internal.

The issue of financial constraint raised by the students of Commerce and Management, and the suggestions offered by them can be converted as Behavioural Change Challenges. The students of Social Science / Social Psychology / Social Work can undertake action research on Behaviour Change Communication experiments to change the situation.

What the tap actually does

- ✓ Brings water closer
- ✓ Reduces physical effort
- ✓ Improves convenience

What the tap does *not* do

- ✗ It does not teach scarcity
- ✗ It does not create discipline
- ✗ It does not build ownership
- ✗ It does not create willingness to pay

“Providing a tap connection makes water available at home, but it does not by itself make people use water carefully, pay for maintenance, or feel responsible for the system.”

Or even simpler:

“Pipes can deliver water, but they cannot deliver responsibility.” Responsibility does not travel through pipelines.

Or,

Final clean takeaway: “Infrastructure can change supply, but behaviour changes only when people understand, agree, and participate.”

Thank you for going through Toolkit – 2 on Rural Infrastructure. You can move on to Toolkit – 3

‘Village Adhyan Toolkit – 3: Rural Employment and Livelihoods’

How Rural Households Earn a Living: This toolkit examines wage employment, self-employment, farm and non-farm livelihoods, and emerging livelihood opportunities. It emphasizes livelihood enhancement and diversification, seasonal vulnerability, income stability, and the link between livelihoods, skills, assets, and local ecosystems. Students are encouraged to see livelihoods as dynamic strategies, not static occupations.

SEG-Capacity Building, Strategy for Convergence and Implementation of Various Govt. Schemes

Village Adhyan Toolkit Series

Toolkit – 1: The Overall Framework

Learning through Exploration: This toolkit introduces the core approach of Village Adhyan. It focuses on how to ask exploratory questions—questions that are not meant to extract quick or isolated answers, but to trace pathways: from cause to consequence, from policy intent to field practice, and from individual experience to systemic patterns. Village Adhyan is about learning to connect, sequence, and relate—to see village realities as flows rather than isolated dots. This toolkit helps students de-learn fragmented thinking and cultivate inquiry that leads to deeper understanding.

Toolkit – 2: Rural Infrastructure

Foundations for Human Development: This toolkit focuses on understanding rural infrastructure systems such as health infrastructure, education infrastructure, Anganwadi centres, drinking water supply, sanitation, housing, roads, electricity, and digital connectivity. Students learn to examine not just physical availability, but functionality, access, quality, and maintenance, and how infrastructure shapes outcomes in health, education, livelihoods, and dignity.

Toolkit – 3: Rural Livelihoods, Skilling and Entrepreneurship

How Rural Households Earn a Living: This toolkit examines farm and non-farm livelihoods, skilling, entrepreneurship, and emerging livelihood opportunities. It emphasizes livelihood enhancement and diversification, seasonal vulnerability, income stability, and the link between livelihoods, skills, assets, local ecosystems and how empowerment emerges through productive engagement. Students are encouraged to see livelihoods as dynamic strategies, not static occupations. It also introduces relevant schemes of the Ministry of Rural Development, and Ministry of Small, Micro Enterprises.

Toolkit – 4: Entitlements and Social Assistance Support

Social Protection and Resilience: This toolkit focuses on entitlements and deprivation, including social assistance for the aged, persons with disabilities, widows, destitute households, and vulnerable groups. It also covers income support, insurance, and resilience-building measures, particularly for those engaged in informal work, rural arts, crafts, and traditional livelihoods. Students learn to distinguish between eligibility, access, delivery, and dignity in welfare systems.

Toolkit – 5: Last-Mile Service Delivery

From Coverage to Saturation: This toolkit examines the challenges of last-mile delivery and the pursuit of saturation of key development indicators—such as ensuring every child attends an Anganwadi, full immunization, freedom from malnutrition and anaemia, universal SHG inclusion for poor women, and smooth transitions from secondary education to higher secondary, technical education, or skilling pathways. The emphasis is on understanding why gaps persist despite schemes, and how coordination and follow-up matter.

Toolkit – 6: Creating Model Villages

Model Villages: This toolkit focuses on the idea of Model Villages, emphasizing that a Model Village is rooted in inspiration, not perfection. A Model Village does not mean a village that is perfect in every sphere of development. At its core, a Model Village demonstrates how focused effort, collective action, and smart use of available resources can bring visible and measurable transformation. It puts across that development does not have to begin everywhere at once. It can begin in one critical area and then naturally spread to related areas, improving overall quality of life. Model village is about ‘inspirational ripple’.

Toolkit – 7: Creating Smart Villages for Vikshit Bharat 2047

Smart Villages: This toolkit focuses on the idea of Smart Villages, emphasizing the creation of a digitally empowered rural citizen—the “Techno Rural Person.” It explores how Digital Public Infrastructure (DPI) can enable seamless Government-to-Citizen services, improve transparency, access opportunities, and support inclusive development. This toolkit connects village-level transformation with the larger vision of Viksit Bharat 2047.

Each **Village Adhyan Toolkit** is designed to be used independently while also fitting into a coherent whole. Together, they encourage students to move from observation to exploration, from fragments to flows, and from understanding problems to imagining pathways for transformation. Elements such as technology, gender, inclusivity etc. can go cutting across all these categories.

