

Results & Comprehensive Report

Coordinates:: 28.9698°, 77.7451°
September 27, 2025

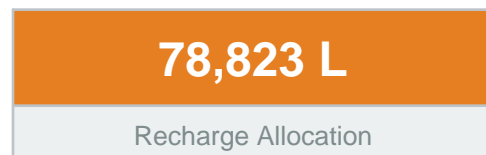
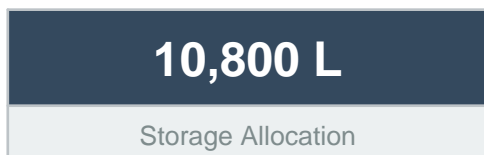
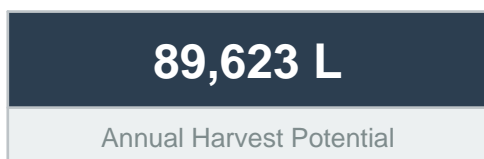
Executive Summary Report

Recommended Strategy:	Hybrid System
System Efficiency:	Fair

Strategic Rationale:

Balanced approach for urban area with good rainfall and water conservation needs

Key Performance Metrics



Recommended System Design

Storage System Specifications

Tank Type:	Underground
Capacity:	10,800 L (10.8 m³)
Recommended Dimensions:	2.8m Diameter × 1.7m Height
Installation:	Underground/Above-ground based on site conditions

Recharge System Specifications

Configuration:	7 Recharge Pits
Total Capacity:	78.8 m³
Recommended Dimensions:	Each: 2.0m Diameter × 4.0m Depth
Total Footprint:	22.0 m²

Supporting Infrastructure

- First flush diverter for water quality management
- Multi-stage filtration system (leaf screens, sand filters)
- Gutter system with appropriate sizing and slope
- Distribution piping with valves and controls

Comprehensive Financial Analysis

Total System Cost	Rs 312,054
Annual Maintenance:	Rs 6,241
Direct Water Savings	Rs 27,000
Recharge Benefits	Rs 394
Total Annual Benefits	Rs 27,394
Simple Payback Period:	11.4 years
10-Year ROI:	-32.2%

System Cost Breakdown

Component	Cost (Rs)
Storage Tank	Rs 64,800
Recharge System	Rs 197,058
First Flush Diverter	Rs 3,500
Filtration System	Rs 4,500
Guttering and Pipes	Rs 1,494
Installation Labor	Rs 40,703
Total System Cost	Rs 312,054

Site Characteristics & Geo-Hydrology

Location Data	Hydro-Geological Data
Coordinates:: 28.9698°N, 77.7451°E Catchment Area:: 100 m² Surface Type:: Concrete Roof Runoff Coefficient:: 0.90 City Classification:: Tier 2 & 3 (Lower Density) Household Size:: 4 persons	Annual Rainfall (2023):: 1000 mm Soil Classification:: Sandy Groundwater Depth (Post-monsoon):: 10.2 m bgl Groundwater Depth (Pre-monsoon):: 12.2 m bgl Principal Aquifer Type:: Alluvial Plains Aquifer Yield:: Moderate

Environmental Impact

Water Independence	45.5% Annual freshwater demand reduction
Groundwater Recharge	78,823 L Annual groundwater replenishment
Runoff Reduction	89.6 m³ Reduced stormwater runoff
CO2 Footprint Reduction	26.9 kg CO2 per year
Energy Savings	358 kWh per year (reduced pumping & treatment)
Carbon Offset Equivalent	Equivalent to planting 1.2 trees annually

Long-term Environmental Benefits

- Reduces dependency on municipal water supply and groundwater extraction
- Helps recharge local aquifers, improving water table levels in the area
- Minimizes urban flooding by managing stormwater runoff effectively
- Reduces energy consumption from water treatment and distribution systems
- Decreases carbon footprint through reduced pumping and treatment requirements
- Supports local ecosystem health through improved groundwater availability
- Contributes to urban heat island reduction through increased water retention
- Promotes sustainable water management practices in the community

Implementation Guidelines

Phase 1: Site Preparation & Permits (2-3 weeks)

- Obtain necessary municipal permits and NOCs
- Conduct detailed soil testing and site survey
- Finalize contractor selection and material procurement

Phase 2: Infrastructure Installation (4-6 weeks)

- Install catchment area preparation and guttering systems
- Excavate and install storage tanks and recharge structures
- Set up filtration systems and first flush diverters
- Install distribution piping and control systems

Phase 3: Testing & Commissioning (1-2 weeks)

- Conduct system pressure testing and leak detection
- Test all filtration and diversion mechanisms
- Commission monitoring and control systems
- Provide user training and documentation

Maintenance Recommendations

Monthly Tasks:

- Clean first flush diverters and remove debris
- Inspect and clean roof gutters and downpipes
- Check water quality and system performance

Quarterly Tasks:

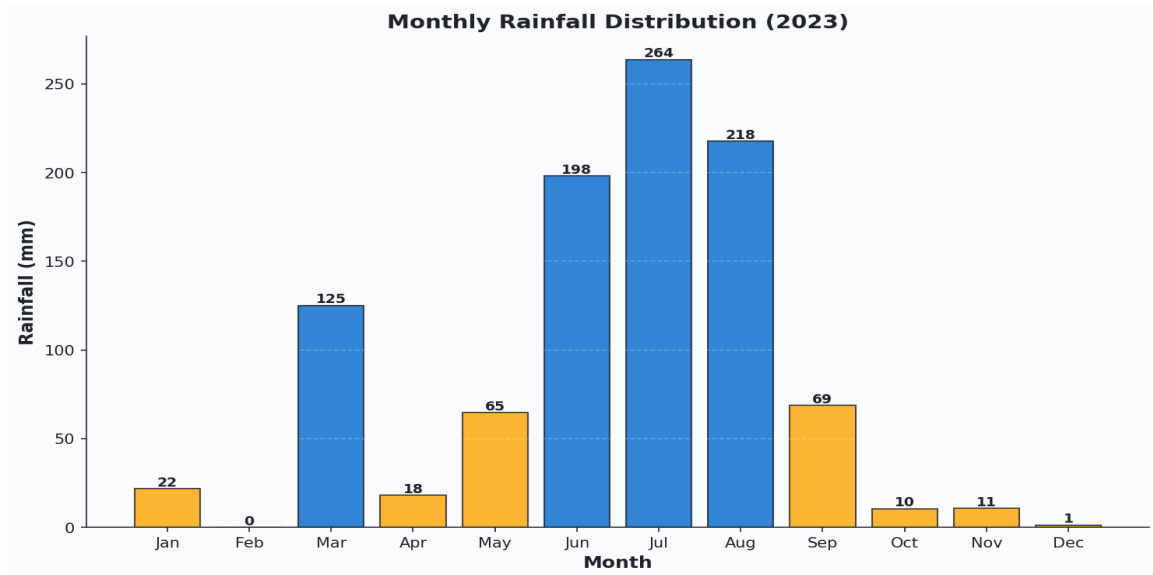
- Replace filtration media in multi-stage filters
- Inspect storage tank for sediment and algae
- Test and calibrate monitoring systems
- Check all pipe joints and connections for leaks

Annual Tasks:

- Professional system inspection and performance audit
- Deep cleaning of storage tanks and recharge structures
- Replacement of worn components and seals
- Water quality testing and system optimization

Estimated Annual Maintenance Cost: Rs 6,241

Monthly Rainfall Distribution



System Cost Distribution

