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**AcuaScholar**

**<<Apartment Name>>**

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# Introduction

Water is an increasingly scarce resource, particularly in rapidly urbanizing areas like Bengaluru. Apartment complexes, housing a significant portion of the urban population, represent substantial points of water consumption. Efficient water management within these communities is not just an environmental necessity but also crucial for ensuring long-term water security and managing utility costs. This report outlines the typical patterns of water usage in our apartment, explores existing conservation initiatives, and identifies further opportunities for saving water. The goal is to provide a framework for understanding and improving water stewardship within residential apartment complexes.

# Our Team

# Contributors

Effective water management study in an apartment complex required a collaborative effort from various stakeholders:

1. **Management Committee/Residents' Welfare Association (RWA):** Responsible for policy-making, overseeing infrastructure, managing finances, implementing community-wide initiatives, and driving awareness campaigns.
2. **Facility Management Team/Maintenance Staff:** Responsible for the operation and maintenance of water infrastructure (pipes, pumps, tanks, STP, WTP), detecting and repairing leaks, and implementing conservation measures in common areas.
3. **Residents:** Key players whose daily habits significantly impact overall water consumption. Their participation is crucial for the success of domestic conservation initiatives.

# Approach

Following systematic approach was used for understanding and managing water usage effectively:

1. **Data Collection:** Regularly monitor water consumption data from various sources (municipal meters, borewell meters, tanker logs, STP inflow/outflow). Install sub-meters for different blocks or high-consumption areas (like swimming pools, gardens).
2. **Water Audits:** Conduct periodic audits to identify leaks, assess the efficiency of fixtures and appliances, and map the water distribution network. This includes both common areas and potentially sample audits within individual apartments (with resident consent).
3. **Usage Analysis:** Analyze collected data to understand consumption patterns – identify peak usage times, high-consumption areas, and seasonal variations.
4. **Resident Surveys & Feedback:** Gather insights from residents about their water usage habits, awareness levels, and suggestions for conservation.
5. **Initiative Evaluation:** Assess the effectiveness of existing conservation measures (e.g., RWH yield, STP treated water reuse percentage, impact of awareness drives).

# Sources of Water

My apartment complexes rely on a combination of water sources:

1. **Municipal Supply:** Water supplied by the local water board (e.g., Bangalore Water Supply and Sewerage Board - BWSSB). Often considered the primary source but may be intermittent or insufficient in quantity.
2. **Borewells:** Groundwater extracted from wells dug within the apartment premises. Quality and yield can vary, and over-extraction is a concern. Regular testing for quality is essential.
3. **Private Water Tankers:** Used to supplement municipal and borewell sources, especially during shortages. This is often the most expensive source and quality can be inconsistent.
4. **Rainwater Harvesting (RWH):** Systems designed to collect and store rainwater, either for direct use (after filtration) or for recharging groundwater aquifers. Increasingly mandated by local regulations.
5. **Treated Wastewater (from STP):** Many larger complexes have Sewage Treatment Plants (STPs) that treat wastewater to a standard suitable for non-potable uses like flushing toilets, gardening, and car washing.

# Water Usage Pattern

Water consumption in apartments can be broadly categorized:

1. **Domestic Use (within individual apartments) - ~70-85%:**

* **Bathrooms:** Showers, toilet flushing, taps (washing hands, brushing teeth). This is typically the highest consumption area. Older single-flush toilets (10-15 litres per flush) and non-aerated taps/showers are major water guzzlers.
* **Kitchens:** Dishwashing, cooking, drinking water purifiers (RO systems often have high water rejection rates), washing vegetables.
* **Washing Machines:** Laundry constitutes a significant portion of domestic use. Machine efficiency varies greatly.
* **General Cleaning:** Mopping floors, cleaning balconies.

1. **Common Area Use - ~15-30%:**

* **Gardening/Landscaping:** Irrigation of lawns, plants, and trees.
* **Vehicle Washing:** Designated or common car wash areas.
* **Common Area Cleaning:** Washing corridors, staircases, basements.
* **Swimming Pool:** Filling, evaporation losses, and backwashing filters.
* **STP/WTP Operation:** Water used in the treatment processes themselves.
* **Leaks:** Undetected leaks in the distribution network (underground pipes, tanks).

# Community Water Conservation Initiatives

These are measures implemented at the apartment complex level:

1. **Infrastructure:**

* **Rainwater Harvesting (RWH):** Implementing effective RWH systems for collection, filtration, storage, and/or groundwater recharge.
* **Sewage Treatment Plant (STP):** Installing and efficiently operating an STP to treat wastewater for reuse in flushing, gardening, and cleaning. Ensuring proper maintenance for optimal performance and compliance.
* **Water Treatment Plant (WTP):** If necessary, for treating raw water (borewell/tanker) to potable standards, optimizing processes to minimize wastage.
* **Dual Piping System:** Separate pipelines for potable water and treated wastewater (for flushing).
* **Sub-metering:** Installing meters for individual apartments or blocks to track consumption accurately and potentially implement consumption-based billing.
* **Low-Flow Fixtures in Common Areas:** Using water-efficient taps, urinals, and toilets in common restrooms (e.g., clubhouse, security cabins).

1. **Maintenance & Operations:**

* **Leak Detection & Repair Program:** Regular checks of pipelines, tanks, and common area fixtures. Prompt repair of identified leaks. Pressure testing sections of the network can help identify hidden leaks.
* **Pressure Management:** Optimizing water pressure in the distribution lines, as excessive pressure increases water flow and stress on pipes/fixtures, leading to leaks.
* **Water-Efficient Landscaping (Xeriscaping):** Using drought-tolerant native plants, mulching, and efficient irrigation methods (drip irrigation, sprinklers with timers). Watering during early morning or late evening to reduce evaporation.
* **Swimming Pool Management:** Using pool covers to reduce evaporation, optimizing filter backwashing cycles.

1. **Awareness & Engagement:**

* **Regular Communication:** Sharing water consumption data, conservation tips, and success stories through notice boards, emails, newsletters, or community apps.
* **Workshops & Demonstrations:** Organizing sessions on water-saving techniques and the importance of conservation.
* **Incentive Programs:** Recognizing or rewarding apartments/blocks with the lowest water consumption or highest reduction.

# Domestic Water Conservation Initiatives

These are actions residents can take within their homes:

1. **Bathroom:**

* **Fix Leaks Promptly:** Address dripping taps, showers, and running toilets immediately. A running toilet can waste hundreds of litres per day.
* **Install Low-Flow Fixtures:** Replace old showerheads, taps, and toilets with water-efficient models (e.g., aerators for taps, low-flow showerheads, dual-flush toilets).
* **Adopt Water-Saving Habits:** Take shorter showers, turn off the tap while brushing teeth or shaving, use mugs for rinsing. Avoid using the toilet as a waste bin.

1. **Kitchen:**

* **Run Dishwashers Only When Full:** Use eco-mode if available.
* **Wash Vegetables/Dishes in a Basin:** Avoid washing under a continuously running tap. Reuse water used for washing vegetables to water plants.
* **Manage RO Reject Water:** Collect the reject water from RO purifiers and use it for mopping, washing balconies, or pre-rinsing dishes.
* **Fix Leaks:** Check taps and pipes under the sink regularly.

1. **Laundry:**

* **Run Washing Machines with Full Loads:** Adjust water level settings according to the load size.
* **Prefer Front-Loading Machines:** They generally use less water than top-loading models.

1. **General:**

* **Report Leaks:** Inform maintenance immediately about any leaks observed in common areas or suspected within the apartment's plumbing.
* **Educate Family Members & Domestic Help:** Ensure everyone in the household understands and practices water conservation.

# Opportunities for Water Conservation

Significant opportunities often exist to further enhance water conservation:

1. **Infrastructure Upgrades:** Retrofitting older apartments with low-flow fixtures. Upgrading inefficient STPs or improving RWH systems. Implementing comprehensive sub-metering.
2. **Enhanced Leak Management:** Using advanced acoustic leak detection tools for identifying non-visible leaks in the underground network. Implementing a proactive (preventive) maintenance schedule rather than just reactive repairs.
3. **Greywater Recycling:** Exploring systems to treat and reuse greywater (from showers, washing machines, bathroom sinks) for toilet flushing or irrigation, separate from the main STP.
4. **Optimizing STP Reuse:** Maximizing the utilization of treated water. Ensuring consistent quality allows for wider applications. Educating residents to overcome reluctance in using treated water for flushing.
5. **Behavioral Change Programs:** Implementing sustained awareness campaigns, gamification, or competitions to encourage long-term water-saving habits among residents.
6. **Data-Driven Management:** Utilizing smart water meters and analytics platforms to gain deeper insights into consumption patterns and identify anomalies quickly.
7. **Policy & Billing:** Exploring tiered water pricing based on consumption (requires accurate sub-metering) to incentivize conservation. Revising community by-laws to mandate water-efficient fixtures during renovations.
8. **Improving Landscape Irrigation Efficiency:** Wider adoption of drip irrigation, soil moisture sensors, and smart controllers that adjust watering based on weather conditions.

By systematically addressing these areas, my apartment community can significantly reduce water footprint, contributing to environmental sustainability and ensuring water availability for the future.