



**BANGALORE  
APARTMENTS'  
FEDERATION**



**Bengaluru Apartments Making Bengaluru  
Operationally Outstanding & Sustainable**

# **WATER MANAGEMENT**

**3<sup>RD</sup> NOVEMBER, 2018**

# **WATER SITUATION - ALARMING FACTS**

- **WATER CRISIS - PER CAPITA WATER AVAILABILITY DOWN BY OVER 70% FROM 1960 TO NOW (CGWB)**
- **BANGALORE EXPERIENCING SHORTAGE WITH MANY AREAS NOT GETTING ADEQUATE WATER OR NO WATER AT ALL**
- **UNCERTAINTY OF SUPPLY – MONSOON DEPENDANT, VANISHING LAKES, POOR HARVESTING , WASTAGE**

# APARTMENT WATER SOURCES & CHALLENGES

- **BWSSB/CAUVERY – (CAUVERY 80% + ARKAVATHY 20%)**
  - CAUVERY WATER TRAVELS 100KM TO REACH HOMES
  - HUGE COST ON TRANSPORT/ PUMPING OF THIS WATER + DISTRIBUTION LOSSES
- **BOREWELL - SINGLE LARGEST SOURCE OF WATER APART FROM CAUVERY!**
- **OPEN WELLS -80-100 FT. HAVE STARTED DRYING & HENCE INCREASING BOREWELL S.**  
URBANIZATION TO FURTHER IMPACT GROUND WATER TABLE RESERVES AS WELL
- **TANKERS!!!!- HUGE COSTS**
- **UNCERTAINTY ON SUPPLY SIDE + HIGH COSTS**
- **WATER MANAGEMENT = REDUCE USAGE + REDUCE WASTAGE + REUSE + RECYCLE + HARVEST**
- **+ ENSURING COMPLIANCES ARE MET – BOREWELL , STP, DUAL PIPING, DISCHARGE NORMS ETC**

# **WATER MANAGEMENT- 3Rs**

APARTMENTS MADE CONCIOUS & INVITED TO SHARE

**BE AWARE - SOURCES OF WATER** IN APARTMENT-BWSSB/ TANKER/  
BOREWELL/ RE-CYCLED/ RWH

**MEASURE USAGE** – WATER METERS FOR SOURCES + INDIVIDUAL UNIT

**HARVEST** – RAIN WATER HARVESTING

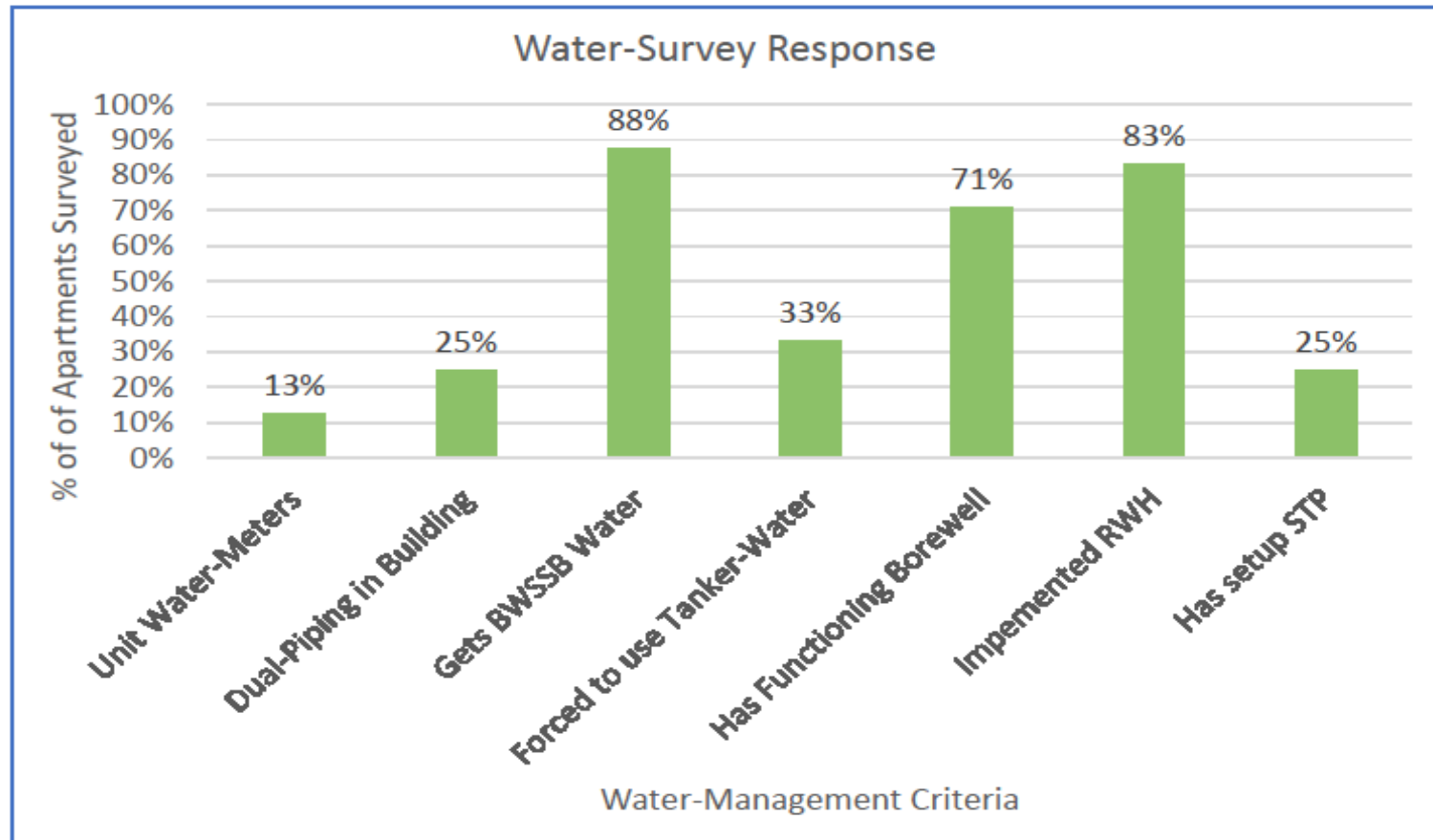
**REDUCE USAGE** –FLOW CONTROL DEVICES

**STOP WASTAGE** - WATER LEVEL CONTROLLERS TO STOP TANK OVERFLOW/  
REUSE FLOWING WATER. PREVENT LEAKAGES, BUCKET WATER BATH ETC. NO  
HOSING FOR CARWASH, SPRINKLERS ETC.

**INNOVATE** - IMPROVED HARVESTING PRACTICES-RECHARGE MECHANISM  
IMPLEMENTED, SURFACE WATER CHANNELISE, RO WATER CHANNELISE ETC

**RECYCLE** – STP,, DUAL PIPING & REUSE

# APARTMENT SURVEY





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# **APARTMENT PRACTICES**

**3<sup>rd</sup> November, 2018**

# WM PRACTICES IN APARTMENTS

- WATER MANAGEMENT-OVERVIEW
- RAIN WATER HARVESTING
- FLOW CONTROL DEVICES
- WATER METERS
- STP DUAL PIPING & REUSE
- WATER CONSERVATION-COMMUNITY PERSPECTIVE



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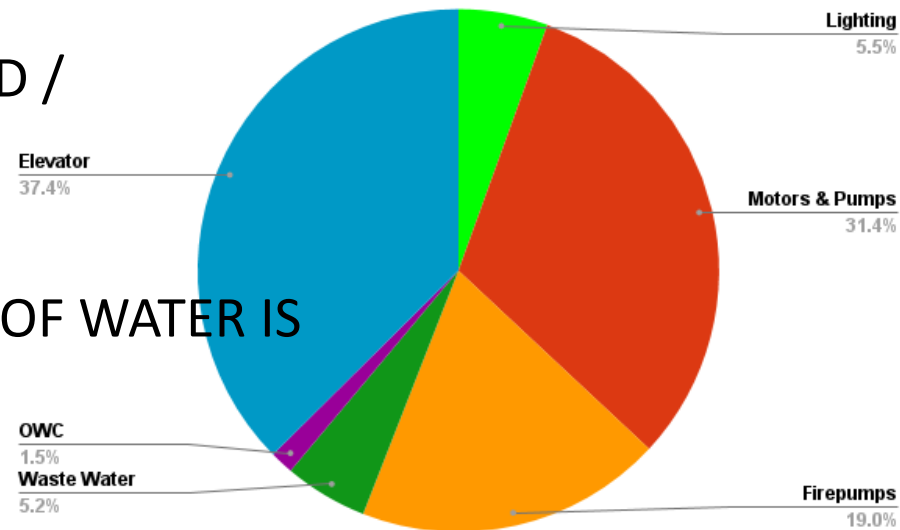
# **APARTMENT PRACTICES WATER MANAGEMENT- OVERVIEW**

**PURVA FAIRMONT, BRIGADE MAGNOLIA GROUP,  
WHITEHOUSE  
PRESENTER – MR PRAKASH**

**3<sup>rd</sup> November, 2018**

# WATER MANAGEMENT – THE NEED

- BWSSB WATER SUPPLY
  - UNCERTAIN TIMINGS & REDUCED SUPPLY
  - INSUFFICIENT TO FILL OHT + GROUND LEVEL TANKS
- OLD BOREWELLS – YIELD REDUCED / DYSFUNCTIONAL/ INEFFICIENT
- COST OF NEW BOREWELLS HIGH
- TANKERS – EXPENSIVE + QUALITY OF WATER IS SUSPECT
- STP WATER – LIMITED USAGE
- RWH – SEASONAL & RECHARGE LIMITATIONS
- COST OF WATER MANAGEMENT GOING UP PROGRESSIVELY



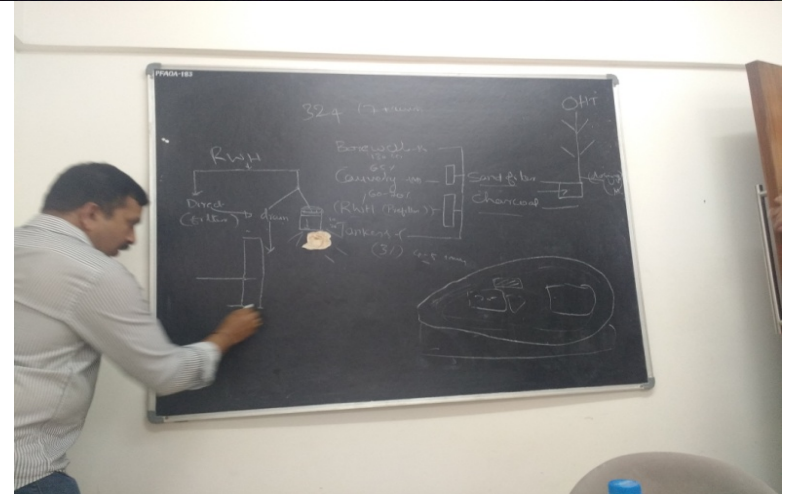
# WATER MANAGEMENT @ PURVA FAIRMONT

- 324 UNITS, 22 BLOCKS IN 7 ACRES, 10+YEARS OLD
- HIGH DEPENDANCE ON TANKERS BEFORE RWH
- RWH 30% - FILTERED & REUSED / 70% - INTO RECHARGE PITS
- ALL WATER SOURCE MADE POTABLE BY FILTRATION + DOZING + UV



# WATER MANAGEMENT @ PURVA FAIRMONT

- WATER SAVINGS UPTO 25% SINCE RWH PUT IN PLACE.
- WASTAGE STOPPED BY DESIGN MODIFICATION OF PIPE NETWORK
- AERATORS IN APARTMENT TAPS.
- FUTURE STEPS:
  - BACK TO DRAWING BOARDS!
  - REUSE GREY WATER
  - WATER METERING





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## **APARTMENT PRACTICES-RWH**

**JALVAYU TOWERS, SHRIRAM  
SADHANA, BRIGADE CASSIA  
Presenter – Mr. Joseph Thomas/Mr.  
Kumarswamy**

**3<sup>rd</sup> November, 2018**

# DESIGN FOR RWH

- Rain Water Harvesting Pit - Children's Park
- Playground cum Rain Water Soak Area
- Sunken Main Lawn Gets Rain Water & Recharges Bore-wells
- Soak Pit in Main Lawn (now Concealed)
- Compost cum Soak Pit-For composting leaves we need moisture & microbes. Using a soak pit saves labour cost
- Rain Water Re-channeled to Ledge
- Shallow Well Fed by Rain Water



# RWH IMPACT @ APARTMENTS

- **ALTERNATE WATER SOURCE HARVESTED FOR REUSE IN GARDENING, COMMON AREA WASH**
- **BOREWELLS REVIVED DUE TO RECHARGE**
  - **WATER TABLE RAISED BY 300+ FEET**
  - **YIELD INCREASED X 2**
- **REDUCTION IN LONG RUNNING OF SUBMERSIBLE PUMPS**
- **ACUTE SHORTAGE –CRISIS OVERCOME BY RWH**
- **DEPENDANCE ON TANKER REDUCED**





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## **APARTMENT PRACTICES -FLOW CONTROL DEVICES-**

**RAHEJA RESIDENCY, SOBHA TULIP,  
CELESTIAL GREENS, ADARSH GARDEN  
Presenter – Mr. BALA DORAI**

**3<sup>rd</sup> November, 2018**

# CHALLENGES @CELESTIAL GREENS

- 80% CAUVERY & 20% TANKERS. NO BOREWELLS.
- CHALLENGES & GOAL IN 2014:
  - EXCESS WATER USE. 110 WATER TANKERS IN SUMMER.
  - AIM PER CAPITA WATER USE AT 135L.
- CONSUMPTION PATTERN IN APARTMENTS:
  - KITCHEN SINKS/BATHROOM WASH BASINS 25%
  - SHOWER 25%
  - FLUSHING 20-25%
  - OTHERS-25%-DRINKING+ COOKING+LAUNDRY+ GARDENING.
- INTERVENTION ON FIRST THREE CATEGORIES FOR SAVINGS
- **USE OF FLOW CONTROL DEVICES – AERATORS**

# AERATORS @ IN WATER SAVING

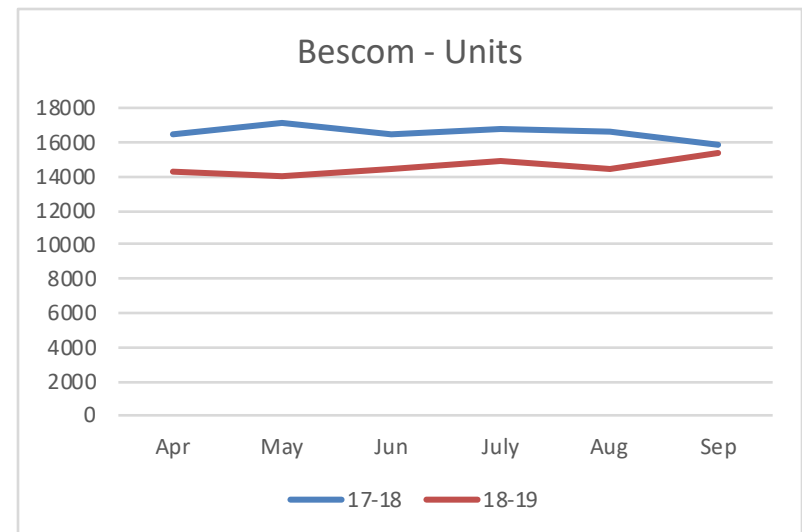
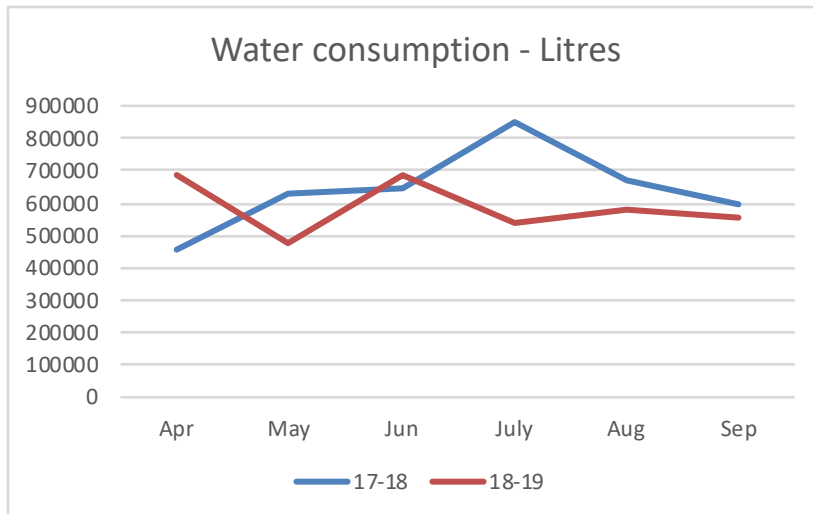


1LITRE – NORMAL FLOW – 4 SECONDS  
1LITRE – AERATOR FLOW – 30 SECONDS  
**WATER SAVINGS UPTO 80%+**



# IMPACT OF INTERVENTION

- AT CELESTIAL GREENS
  - PER CAPITA CONSUMPTION DROP BY 25%
  - TANKER WATER USE NEAR TO NIL
- AT SOBHA TULIP
  - 55% DROP IN BWSSB WATER CONSUMPTION OVER A 6 MONTH PERIOD.
  - SIGNIFICANT REDUCTION IN ELECTRICITY BILLS
- SAVINGS TO WORK ON: SHOWER HEADS / FLUSHTANKS





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# **APARTMENT PRACTICES WATER METERS**

**KRYSTAL CAMPUS II, NAGARJUNA  
PREMIER, REAL HOUSE  
Presenter – Mr. ANAND JALAKAM**

**3<sup>rd</sup> November, 2018**

# WATER METERS

- WATER METERS
  - MEASURE OF CONSUMPTION AT SOURCE OF SUPPLY
  - MEASURE INDIVIDUAL APARTMENT LEVEL USAGE
- PAY PER USE SYSTEM LIKE ELECTRICITY TARIFF
- INDIVIDUAL RESPONSIBILITY & PARTICIPATION IN USING RESOURCE JUDICIOUSLY
- HELPS IDENTIFY & FIX LEAKAGES
- DRAWBACK- INSTALLATION CHALLENGES
  - HIGH CAPITAL COST
  - CHANGING HABIT TO PAY PER USE

You can't manage  
what you can't **measure**  
Peter Drucker



# WATER METERS@NAGARJUNA PREMIER

- VERY HIGH WATER CONSUMPTION 275L/UNIT/DAY
- ACTIONS
  - ARREST LEAKAGES - PLUMBERS MADE TO VISIT ALL APARTMENTS & FIX ALL LEAKS
  - CHECKED WATER PRESSURE ON DIFFERENT FLOORS.
    - 16<sup>TH</sup> FLOOR - WATER PRESSURE 1 KG, = 10 LITRES FLOW /MINUTE
    - 10<sup>TH</sup> FLOOR - WATER PRESSURE 3 KG = 21 LITRES FLOW /MINUTE
    - 5<sup>TH</sup> FLOOR - WATER PRESSURE 4.5 KG = 30 LITRES FLOW /MINUTE
    - 1<sup>ST</sup> FLOOR - WATER PRESSURE 5 KG = 37.5 LITRES FLOW /MINUTE
  - NO CONSENSUS TO INSTALL PRESSURE REDUCTION VALVES
- **STARTED EXPLORING WATER METERS FOR BELOW BENEFITS :**
  - WATER CONSERVATION (USE CASES INDICATE 30-40% SAVINGS)
  - FAIRNESS OF USAGE ( USERS CHARGED BASED ON ACTUAL CONSUMPTION)

# WATER METERING CHALLENGES & IMPACT

- OPEX MODEL

- FIXED ONE TIME CHARGE OF RS. 2000 PER METER
- MONTHLY CHARGE OF RS. 45 PER MONTH / PER METER

- EARLY TRENDS :

- AVERAGE WATER CONSUMPTION DROPS FROM **21.5 LAC LITRES/MONTH VS 25.28 LAC LITERS /MONTH.**
- **>1000 LITRES PER DAY. APARTMENTS =15, REDUCED TO 9 IN 3 DAYS.**
- PEER DATA AVAILABLE ON SMS/APP TO COMPARE & REDUCE USAGE
- FEW APARTMENTS HAVE SHOWN **REDUCTION IN WATER CONSUMPTION BY AROUND 70%.**



# IMPACT IN OTHER APARTMENTS

## AT REAL HOUSE

- CONSUMPTION = 60000 LITRES / DAY @ 414 LITRES/HH
- CONSUMPTION DROPPED TO 40000 LITRES / DAY @ 277 LITRES/ HH
- 7.3 MILLION OF LITRES OF WATER PER ANNUM!

## AT KRYSTAL CAMPUS

- WATER CONSUMPTION REDUCED BY 35%
- ZERO LEAKAGE – LEAKAGES SPOTTED DUE TO DAILY METER READINGS FIXED ASAP

“BEFORE INDIVIDUAL METERS – WE USED TO PURCHASE 66KL PER DAY, NOW IT IS 44KL PER DAY.”





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# **APARTMENT PRACTICES** **STP –TREAT RECYCLE & REUSE**

**RANKA AQUA GREENS, VAISHNAVI  
RATHNAM, ADARSH GARDENS  
Presenter – Mr. SHANKAR RAM**

**3<sup>rd</sup> November, 2018**

# STP & REUSE -RANKA AQUA GREENS

- STP PLANT - 4 CHAMBERS AND TWO FILTERS. 60KLD CAPACITY
- THE TREATED WATER IS THEN PUMPED TO THE DEDICATED OVERHEAD TANKS, WHICH IS THEN USED TO FLUSH THE TOILETS IN RESPECTIVE APARTMENT.
- THE TREATED WATER IS ALSO USED TO WATER THE LAWNS AND PLANTS IN THE GARDEN.
- **NO WATER IS DISCHARGED OUTSIDE THE APARTMENT COMPLEX OR INTO THE STORM WATER DRAIN OF BBMP.**
- OPERATOR – MANAGES DAILY LOGS, ENSURING WORM LESS, ODOR LESS WATER IS AVAILABLE FOR REUSE BY VARIOUS CHLORINATION SCHEDULES & PROCESSES
- **HARDLY ANY COMPLAINT FROM THE RESIDENTS ON EITHER THE QUALITY OF WATER OR INSUFFICIENCY FOR LAST 6 MONTHS.**

# STP & REUSE –OTHER APARTMENTS

- AT VAISNAVI RATHNAM,
  - EXCESS WATER ARRANGED TO BE UTILISED FOR GARDENING IN A SCHOOL NEARBY THE APARTMENT.
- AT ADARSH GARDEN
  - STP UNIT INSTALLED DESPITE BEING OLD APARTMENT
  - 1.65 LAKH LITRES GENERATED – INTERNALLY REUSED @65-70 LAKH LITRES
  - FOR EXCESS WATER ENGAGED WITH COMMUNITY & CIVIC AGENCY TO SEEK ALTERNATE SOLUTION
    - TAKEN BY TANKER & USED FOR MUNICIPAL PARK/ GARDEN / CONSTRUCTION REUSE ETC.
    - FURTHER TREATMENT & REUSE TO CHARGE RWH PITS/ OTHER.



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# **APARTMENT PRACTICES WM-BEYOND THE PREMISES**

**3<sup>rd</sup> November, 2018**

# RESIDENT PARTICIPATION -PRESERVING LAKES

- COMMUNITIES VIGILANT ON LAKE ENCROACHMENTS
- REPORT TO AUTHORITIES ON POSSIBLE VIOLATIONS FOR ACTIONS
- BRING TO THE ATTENTION OF THE CONCERNED AUTHORITIES TO:
  - REJUVENATE THE LAKE BY DE SILTING & RESHAPING WHAT IS LEFT OF THE LAKE.
  - WHERE POSSIBLE, CLEARING THE RAINWATER & OTHER CHANNELS.
  - DIVERTING THE MUCH NEEDED SURFACE RUNOFF OF RAINWATER INTO THE LAKE.
  - HELP IMPROVE YIELDS IN NEARBY WELLS & BOREWELLS

# **OVERALL WISE WAY OF WATER MANAGEMENT**

CREATE AWARENESS OF SCARCITY AND TO USE WATER  
JUDICIOUSLY AMONG COMMUNITY & NEIGHBORHOODS

MEASURE & MONITOR WATER UTILISATION & ALL SAVINGS  
METRICS, COMMUNICATE

PERIODIC WATER AUDITS / USAGE REVIEW

PERIODIC DRIVES & INITIATIVES TO CONSERVE WATER

NETWORK & ENGAGE IN COMMUNITY TO FIND INNOVATIVE WAYS  
OF REDUCE, RECYCLE OR REUSE



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## **IN CONCLUSION**

**3<sup>rd</sup> November, 2018**

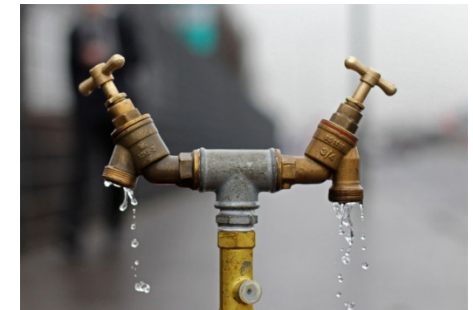
# WATER RESOURCES AWARENESS

- CAUVERY/BWSSB
- OPEN WELL
- BOREWELL
- RWH – TERRACE & RUNNING WATER
- TANKERS
- BOTTLED WATER
- STP/ WASTE WATER – TREATMENT & REUSE
- REDUCE WATER WASTE
- REDUCE USAGE
- MEASURE –MONITOR-CONTROL- USE
- PAY PER USE
- AWARE EDUCATE PARTICIPATE

# BENEFITS OF PROPER WATER MANAGEMENT

1. AVAILABILITY! NO SHORTAGE
2. CONSUMPTION REDUCED
3. SUBSEQUENT COST SAVINGS
4. REDUCED MAINTENANCE BILLS
5. ENVIRONMENT CONSERVATION
6. BENEFITS TO FUTURE GENERATION

# STOP WASTAGE - SIMPLE MEASURES GO A LONG WAY..



# DID YOU KNOW?



**HOSING IS BANNED?? IF REPORTED FINE IMPOSED**

**WATERING PLANTS DURING EVENING –SAVES WATER?**

**IT TAKES ONE PHONE CALL TO PLUMBER TO FIX THE AND STOP THAT LEAK!!**



WATER WATER EVERYWHERE, THAT  
WAS THE GIFT –A FEW YEARS ...BACK  
WATER WATER AROUND SOMEWHERE,  
THATS THE WASTAGE THAT WE STARE  
WATER WATER IS NOW SCARCE, IT'S  
VERY REAL AND NOT A FARCE  
WATER WATER – PAUCITY IN FUTURE,  
TRY TO SAVE IT IF YOU CARE





**Apartments have been SUCCESSFUL  
at water conservation**

**WE WILL CONTINUE OUR EFFORTS &  
SHARE OUR BEST PRACTICES TO HELP  
BUILD AN OUTSTANDING  
BENGALURU!**

**THANK YOU!**