Water Management in Food Service Industry

Myths, Facts & Reality check

Ketan BC
ketan@indiasynergy.com

Synergy
GLOBAL SOURCING
...Challenge us

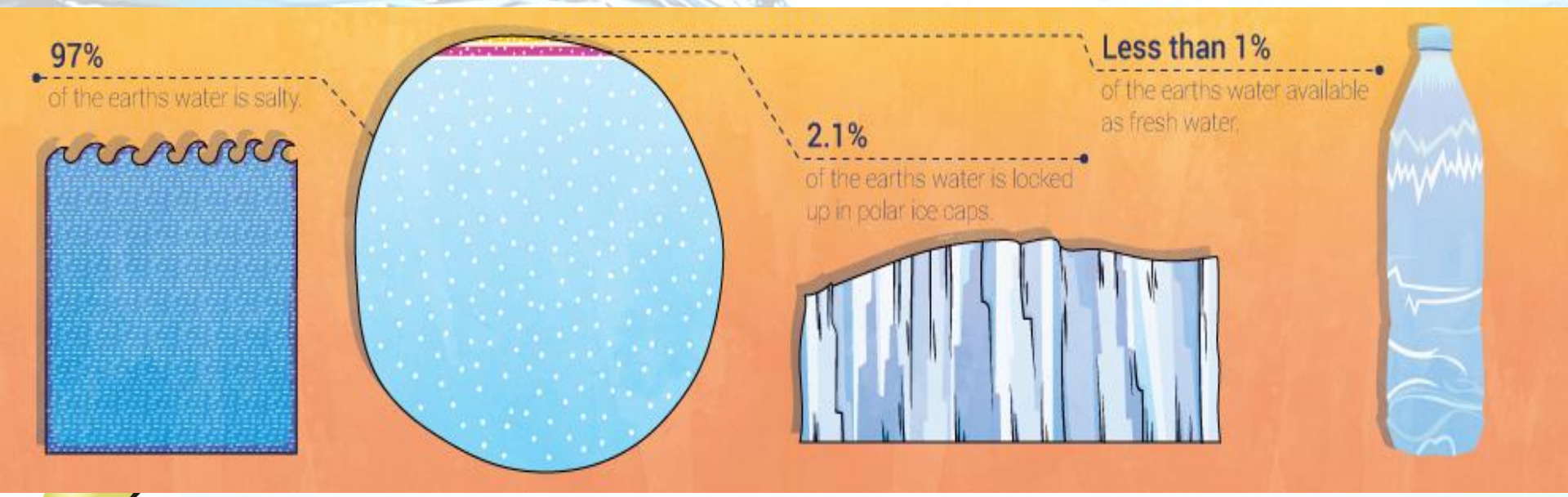
Simple But Critical Questions That Need Scientific Answers…

- How much water is really **enough** ?
- How safe is our water in India ?
- Are our plumbing fixtures designed for safe water quality ?
- Are good looking plumbing fixtures, reliable and rugged enough for commercial applications ?

Synergy
GLOBAL SOURCING
...Challenge us

How Much Water Do We Have ?

- 97% of the water is salty.
- 2.1% of fresh water is locked up in polar ice caps.
- So, only 0.9% of world's water is accessible.



Courtesy : Mr. Shravan Kumar

Synergy
GLOBAL SOURCING
...Challenge us

How Much Water Do We Have ?

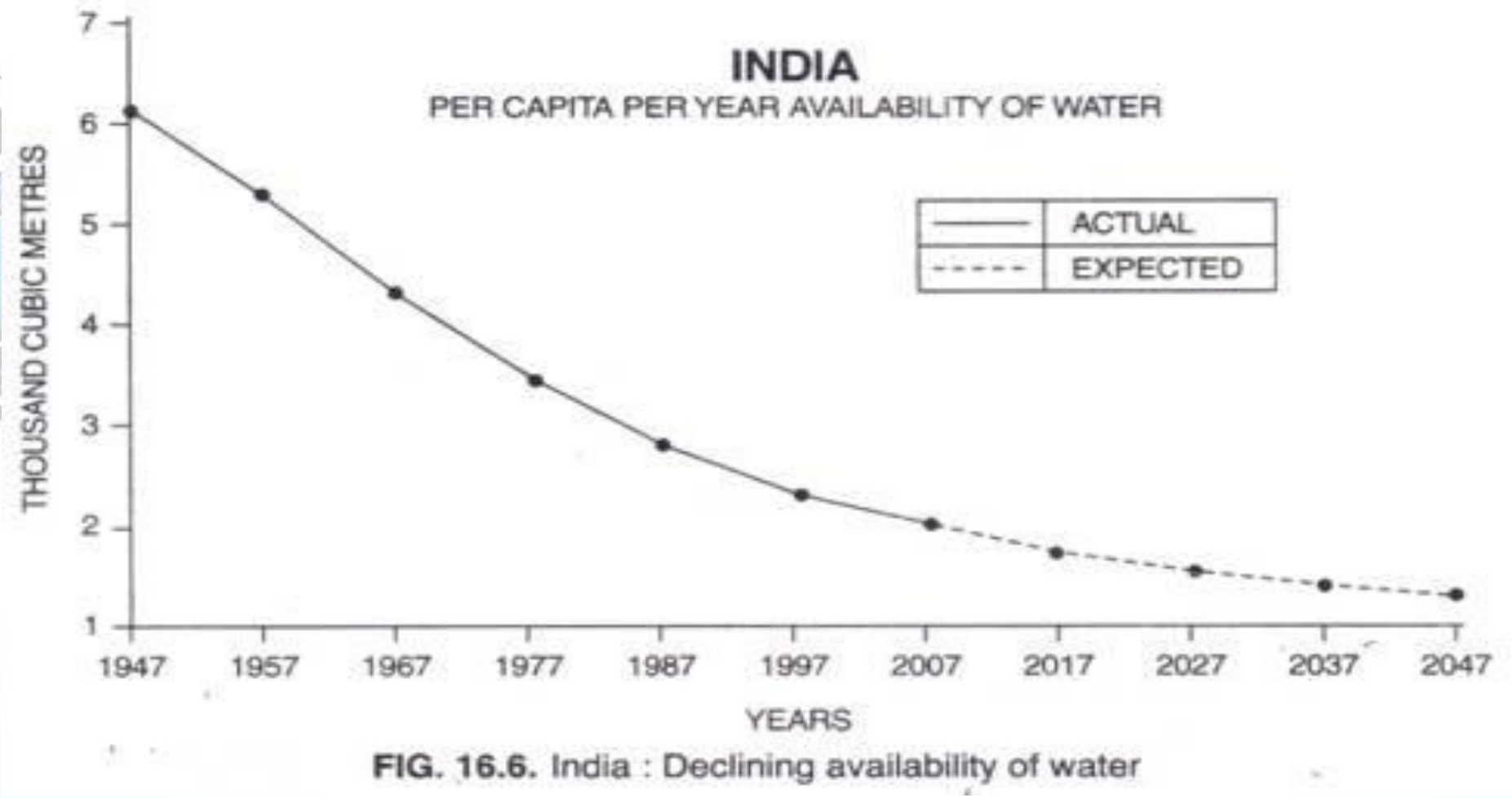
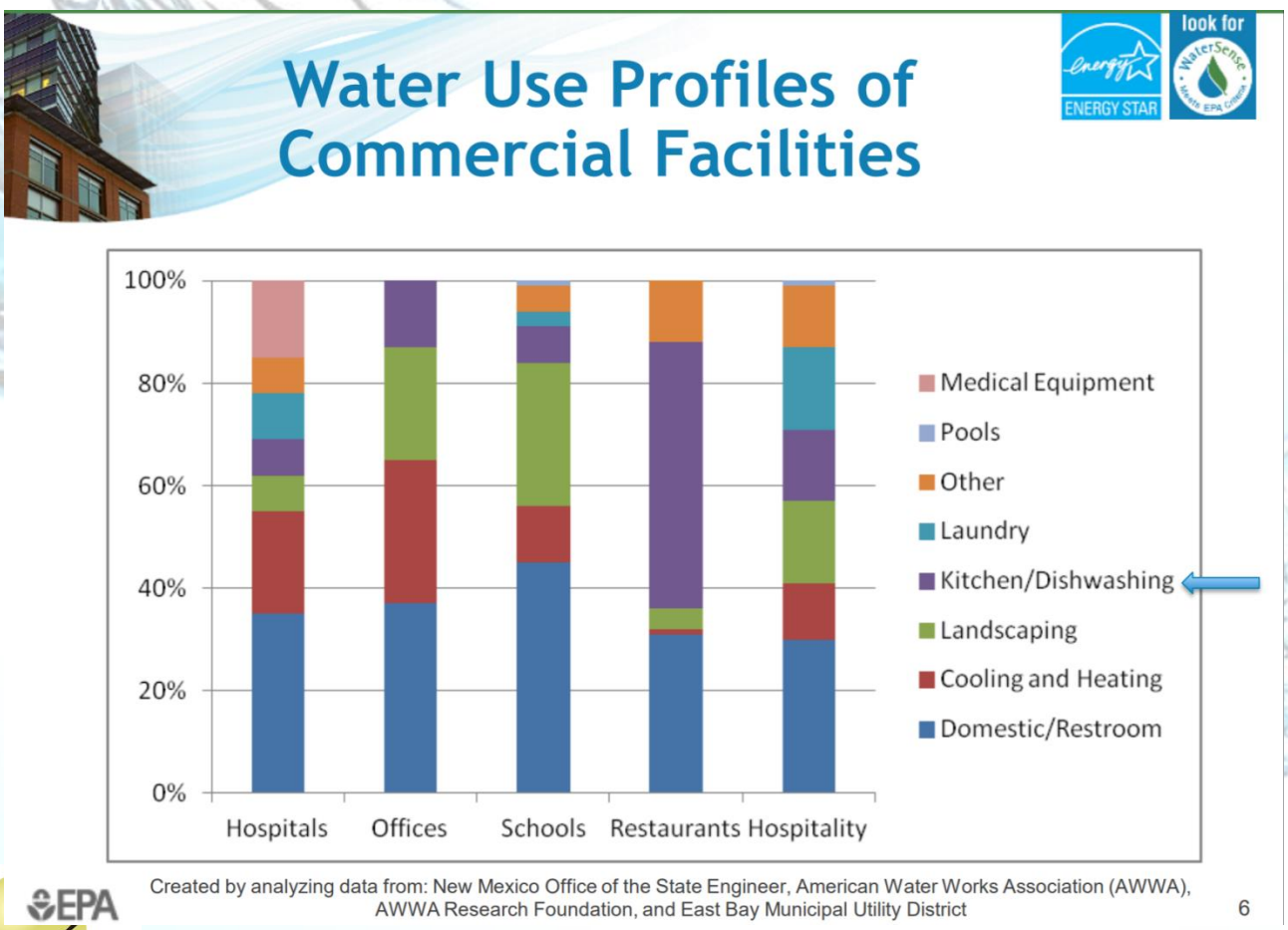


FIG. 16.6. India : Declining availability of water

Courtesy : Mr. Shravan Kumar

Water in Food Service

- **Nearly 80% water used in hotel kitchens is used in washing, that includes washing of agro products, utensils, dishwashers, floor wash-down, rest rooms and hand washing.**



The question to ask is…how much is the right quantity ?

Are we conscious that we really do not have enough ?

EPA

Synergy GLOBAL SOURCING ...Challenge us

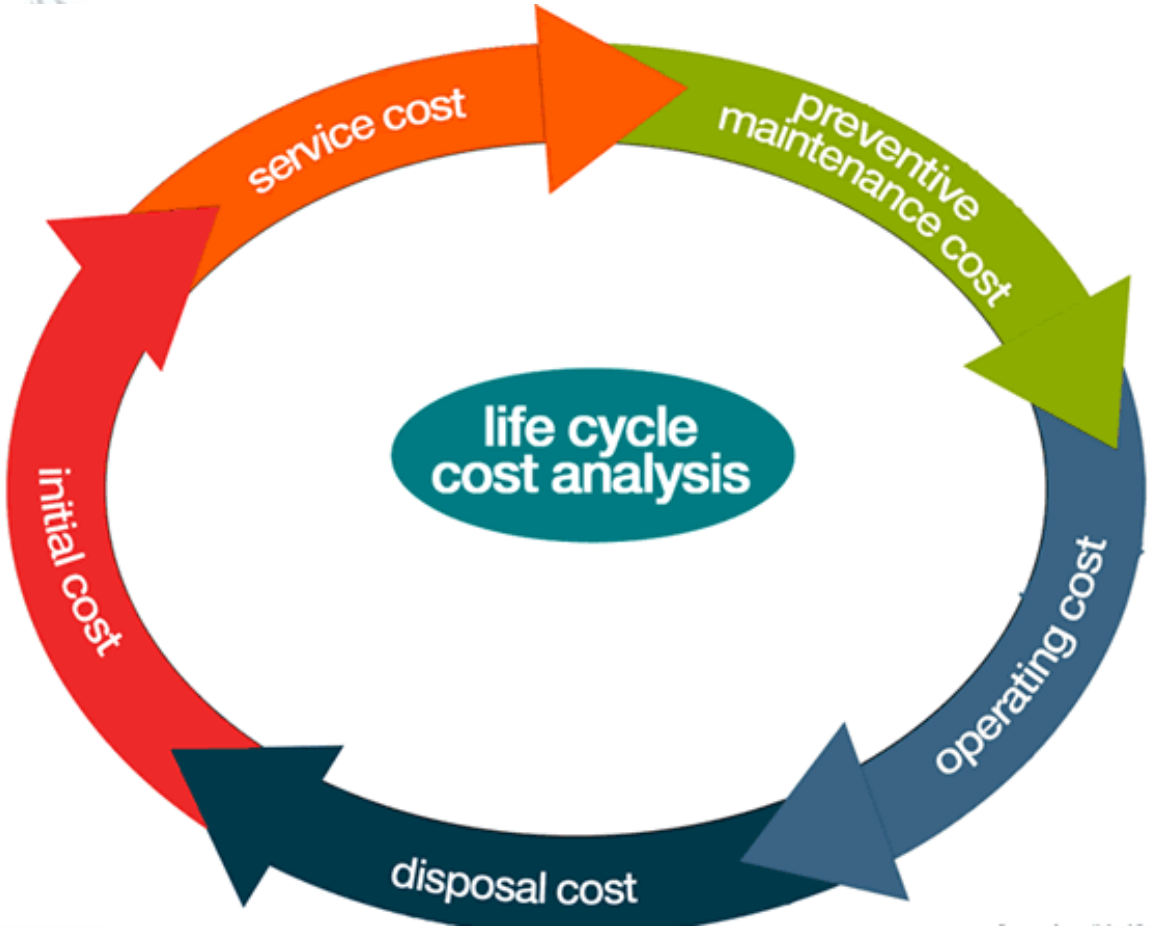
So Much Water, For A Coffee!

It takes 200 liters of water to produce coffee beans for one cup of coffee.

Courtesy : Mr. Shravan Kumar

Synergy
GLOBAL SOURCING
...Challenge us

Cost of Purchase Vs Life Cycle Cost



Synergy
GLOBAL SOURCING
...Challenge us

What is Life cycle of plumbing based on..

- **No. of cycles** of usage : Is Food Service same as domestic usage cycles. Typically **cartridges** are designed for 5,00,000 cycles / last only less than 400 – 500 days.

  Commercial application demand min. 1 million / 10 lakh cycles.

- **Design & Construction :** Cast or forged and copper alloys used.
- **Environment** : Must work in corrosive area. Chrome plating must remain intact for years. Chrome contamination in food is very harmful.
- **Knowledge** level of people : people who use, **often don't like their job**, must withstand abuse and vandalism.

Synergy
GLOBAL SOURCING
...Challenge us

Plumbing Fixtures in Food Service

- Specify and select the right design and make of plumbing fixtures.
- What harm do off-the-shelf domestic plumbing fixtures cause to your bottom line.
- Typical Condition of plumbing fixtures after years of service

Synergy
GLOBAL SOURCING
...Challenge us

Cost Vs Value

Why some faucets, looking exactly same, cost about INR 1500 & some cost INR 5000 ?

Why some pre-rinse units cost less than INR 5000 and some cost INR 10,000 to 20,000 ?

Can we all go into all technical details to make a purchase ?

Or choose a manufacturer that meets and exceeds international standards ?

How can we make well informed purchase decisions that impact the life cycle costs ?

Do we tracking water leakage, plumbing costs, replacement costs ?

How many of us actually claim warranty on plumbing products ?

Synergy
GLOBAL SOURCING
...Challenge us

Life of a faucet after about 2 years…

Pictures from kitchen of leading 5 start property in Bangalore

Synergy
GLOBAL SOURCING
...Challenge us

Water Audits, Why ?

T&S RELIABILITY BUILT IN™

Sustainability Through Water Conservation

Water Audits with T&S Brass
Water Availability

Although about 70% of the world's surface consists of water, only 1% is actually accessible to us. **At the current growth rate, the world's population is estimated to reach an incredible 9 billion people by the year 2040.** This means the available water per person will continuously decrease and we must do everything we can to sustain our populations and earth.

Synergy GLOBAL SOURCING ...Challenge us

Water Audits - Case Study of A Major QSR chain.

The Process

Updated fixtures at select chain locations included pre-rinse units, pantry faucets and other ancillary plumbing products.

Nearly 1,000 existing pre-rinse spray valves were replaced with high-efficiency models, reducing flow from **1.42 gallons per minute (gpm) to 0.65 gpm**.

Annual water cost for each pre-rinse spray valve was cut by more than half, **from $904 to $414**, based on the chain's standardized parameters. A reduced demand for energy to heat the water also resulted in more than **$2,400 of additional annual savings** per spray valve.

A limited number of other faucets, including hand sink faucets, were also updated to reduce water consumption, generating annual water and energy **savings of at least $1,600** for each restaurant.

The Result

The chain tracked the updates for two years — calculating results from a total of 1,286 products the first year and 1,251 products the second year. Total water and energy savings was approximately **$6 million** for the two years.

Water Audit - Case Study of A Fast Food Unit.

PERSONNEL ON SITE DURING AUDIT

From T&S:	RAJESH CHOWDHURY, KETAN W/ SYNERGY, ANOOP W/ SYNERGY
From Audited Facility:	MANOJ MATHEW

THE FOLLOWING FACILITY DATA WAS USED FOR ALL RELEVANT PRODUCT CALCULATIONS:

Water Heater Fuel Type:	Electric
Water Heater Efficiency:	95%
Needed Temperature Rise Through Heater:	10° C
Electric Cost per kWh:	$0.16
Water Cost:	$2.62/CCF
Sewer Cost:	$3.00/CCF
Operating Days Per Year:	365
Number of Facilities:	1
Average Daily Customer Traffic:	1,000

Power Tariff cost / commercial / kWh = Rs.9.60

Water cost is US$ 2.62 per CCF, 1CCF = 748 gallons (2831 litres) current water tariff in Bangalore city is Indian Rupees 65 per 1000 litres for commercial use.

Synergy
GLOBAL SOURCING
...Challenge us

Water Audit - Case Study of A Fast Food Unit.

DEPARTMENT	PRODUCT NAME	QTY.	PHOTO	LOCATION DESCRIPTION	RECOMMENDED MODEL #	RECOMMENDED MODEL PRICE
(Kitchen)	Add-On Faucet	1		KITCHEN	B-0199-01-WS	$12.30
(Kitchen)	Spray Valve	1		KITCHEN	B-0123-ADF12-BJ	$711.00

Synergy
GLOBAL SOURCING
...Challenge us

Water Audit Analysis of Savings & Payback Period

PER FACILITY:

Total Annual Savings:	$16,822.22
Total liters saved:	2,983,300
Water savings:	$2,760.77
Energy savings:	$13,445.18
Sewage savings:	$3,161.18
New equipment costs:	$1,443.09
Savings less costs:	$15,379.13
Payback period:	0.09 years

Water saved using simple measures…29, 83,300 litres, savings of nearly Rs.9.99 lakhs / year.

Synergy
GLOBAL SOURCING
...Challenge us

Calculator Settings

SPRAY VALVE SAVINGS

Standard spray valve:	16.09 L/min
T&S model flow rate:	2.46 L/min
Operating hours per day:	3
Operating days per year:	365
Total liters saved in year:	895,491

AERATOR SAVINGS

Standard faucet water flow rate:	8.33 L/min
T&S low-flow aerator water flow rate:	3.79 L/min
Number of employees/ day in kitchen:	3
Number of handwashes/ employee/day:	8
Operating days per year	365
Seconds per handwash:	20
Total liters saved in year:	13,257

CARTRIDGE SAVINGS

Standard Compression (not quarter-turn)

40 psi to both inlets:	68.36 L/min
60 psi to both inlets:	87.41 L/min

T&S Cerama Cartridge (quarter-turn)

40 psi to both inlets:	48.19 L/min
60 psi to both inlets:	55.19 L/min

* Data from testing B-0230 faucet with standard 457 mm nozzle, with index tip (screen outlet), no aerator

Synergy
GLOBAL SOURCING
...Challenge us

Typical Water Leakages Go Un-Noticed !

Synergy
GLOBAL SOURCING
...Challenge us

Leakage…Just A Drop!

1 DROP PER SECOND = **11,356 liters PER YEAR**

That's enough water to fill about 1 water tanker & 3 fire trucks.

Synergy
GLOBAL SOURCING
...Challenge us

Potential Areas of Water Conservation

Item	Current Flow (Liters)	Recommended Flow (US Gallons)	Recommended Flow (Liters)	Difference (Liters)	Min Used/ Day	Total Liters/ Day	Days Used/ Year	Potentially Saved Liters/Year
Pre Rinse Unit-Pot wash	14	1.07	4.05	9.95	10	99.5	300	**29,850**
Pre Rinse Unit-Dish	13.6	1.07	4.05	9.55	15	143.25	300	**42,975**
Pre Rinse Unit-Prep	5.5	1.07	4.05	1.45	15	21.75	300	**6,525**
Pre Rinse Unit-Banquet	9.5	0.5	1.89	7.61	10	76.10	300	**22,830**
								102,180

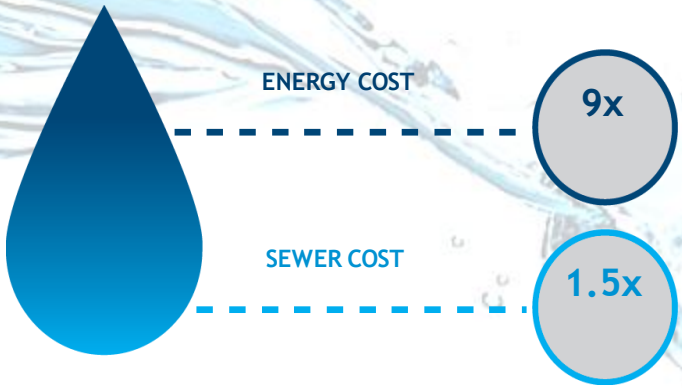
The right spray valve for pre-rinse units can help save huge quantity of water.

Synergy
GLOBAL SOURCING
...Challenge us

Water is Not Just Water

Water conservation is more important than ever — but did you know that water costs aren't simply based on how much water you use?

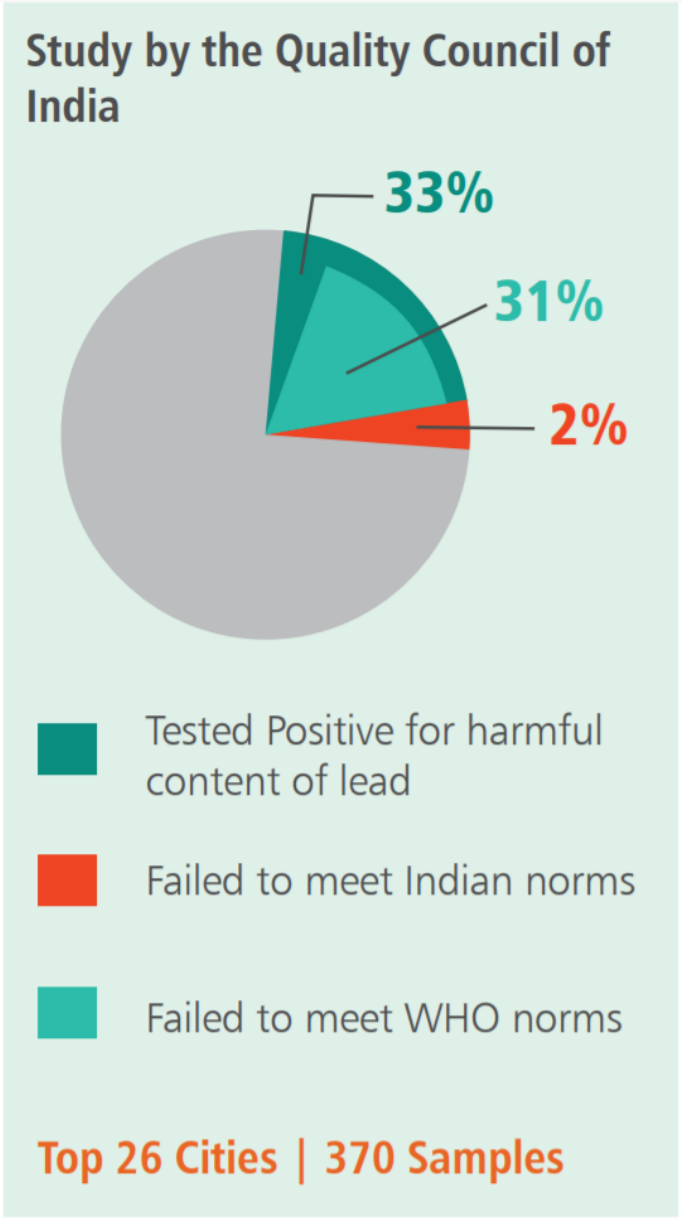
There are also **ASSOCIATED ENERGY COSTS** (for tempered water) and sewage costs for every drop of water used.



Energy/heating costs are typically **9x THE COST** of water, and sewage is typically **1.5x THE COST** of water.

Synergy
GLOBAL SOURCING
...Challenge us

How Safe is Water in India



Lead contamination in drinking water

According to an investigation by the Quality Council of India, 33 percent of over 370 samples of water from the top 26 cities of India have tested positive for harmful content of lead.

Synergy
GLOBAL SOURCING
...Challenge us

Why is Lead Harmful

Several studies in lab animals have found that **exposure** to **lead** compounds (by swallowing or other means) **can cause cancer**. Kidney tumors have been linked with **lead** most strongly, but tumors of the brain, lung, and some other organs have also been linked to **lead** in different studies.

Recent examples: Maggi, Lead free paints, etc.

Synergy
GLOBAL SOURCING
...Challenge us

Where Does Lead Come From ?

Water sitting for several hours or overnight in a brass faucet can leach lead from the brass faucet interior.

Why is lead used in brass ?

How much lead content is present in today faucets and components ?

What is the safe content of lead in brass ? (as per EPA Act of USA)

India seems to ignore this on temperamental level. The shining faucets largely used in India, are actually made up of Brass, which causes lead contamination in water and causes severe damage to human body.

Synergy
GLOBAL SOURCING
...Challenge us

Indian Standards – Are We Aware and is it Enforced ?

'**Lead content in water in India** far above BIS specifications' BANGALORE: Despite the BIS Drinking **Water** Specifications (IS-10500 1991) prescribing **lead content in water** not to exceed 50 parts per billion, in **India** it shockingly ranges from 50 to 400 parts per billion.

Even bottled mineral water does not specify the accumulated lead content in water. The only way to know is to get it tested.

Synergy
GLOBAL SOURCING
...Challenge us

How Much Lead is Allowed for Safe Water & The Status Today?

- Safe lead content in any plumbing part is maximum 0.1 % max.
- Currently any Indian plumbing fixture will test min 3.5% lead content in the parts.

That is a shocking 35 times higher than safe limits ?

Synergy
GLOBAL SOURCING
...Challenge us

Chrome Plating of Brass Faucets

This is how a faucet of a leading brand looks like in 3 years of operation.

In fact Hex Chrome generally used on faucets is also carcinogenic. Trivalent chrome is the safe alternative.

Major **health effects** associated with exposure to hex chrome include **lung cancer**.

Synergy
GLOBAL SOURCING
...Challenge us

Chrome Plating of Brass Faucets

Nickel Chrome plating standard : ASTM B456-03 service condition 2 min.

1. Needs a copper strike
2. 12 microns thick Nickel
3. 0.25 microns of Chrome for decorative look.
4. Salt spray of about 450 hours

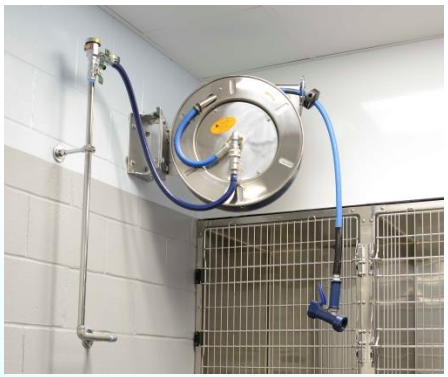
Synergy
GLOBAL SOURCING
...Challenge us

Improving Kitchen Efficiency and Optimising Labor Costs

Raw material processing, washing and housekeeping account for more than 40% of labor deployed.

Labor costs & time can be cut by nearly 50% by :

- **Using the right rinsing method to save washing and cleaning effort**
- **Faster washing of difficult utensils / dishes**
- **Faster and more effective wash down of floor and kitchen counters**
- **Better ergonomics and more effective work force leads to higher productivity.**



Synergy
GLOBAL SOURCING
...Challenge us

Rinsing Spray Valves

Low flow : Rinsing (5.37 LPM to 2.46 LPM)

Typically low cost spray valves have flow rate of more than 12 LPM

High Flow : For pot filler & wash down (8.59 LPM)

That's a hell lot of water down the drain !

Open hose used for floor washing have upto 30 LPM)

Synergy
GLOBAL SOURCING
...Challenge us

Water Conservation Using Aerators

Save upto 70% water by replacing aerators

Aerators

An aerated flow pattern pulls the ambient air into the water, creating a softer water flow pattern that also reduces splash.

To achieve an aerated flow pattern, you must attach an aerator.

Laminar Flow Outlets

These outlets restrict surrounding air from mixing with water.

Another term for laminar flow is "solid water."

Non-Aerated Spray Devices

With these devices, a non-aerated flow pattern creates a fan-type spray.

Currently Indian faucets have a flow rate of 10-15 LPM, but for most applications 3-4 LPM is sufficient. This can be achieved just by replacing aerators

Synergy GLOBAL SOURCING ...Challenge us

How Can We Make An Impact ?

- Put a task force together to do water audits & implement measures ?
- We need to influence some government policies in a big way through associations, experts & petitions to

1. Control lead content in plumbing parts.
2. Regulate flow rates for different kitchen applications
3. Quality of parts used in plumbing for commercial application

Synergy
GLOBAL SOURCING
...Challenge us

Let’s Manage Water

Before There is Little Left To Be Managed

Synergy
GLOBAL SOURCING
...Challenge us