



**“WE ARE NOT IN THE LOOP”**

**RESOURCE WASTAGE AND CONSERVATION  
ATTITUDE OF EMPLOYEES IN INDIAN WORKPLACE**

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82% of the world's population is in developing nations





Commercial sector constitutes a significant share (9.89% in 2009-10) of Indian energy consumption

IT organizations contribution to India's 2012 GDP was 7.5%



HCI+Sustainability work has focused on **residential users** in **developed nations** [Chetty et al 08, Dillahunt et al 09, Pierce et al 10]

Qualitative data on conservation across socio-economic groups in U.S.



# DEEP CONSERVATION

In India, conservation practices are [Shrinivisan et al 13]

**habitual** (natural and unnoticed)

**deeply integrated** into daily activities

**contextually** imposed

combine traditional practices, manual effort, and technology



# RESEARCH QUESTIONS

## How

employees perceive wastage and conservation in an Indian workplace?

it differs from home?

to minimize wastage and conserve resources?

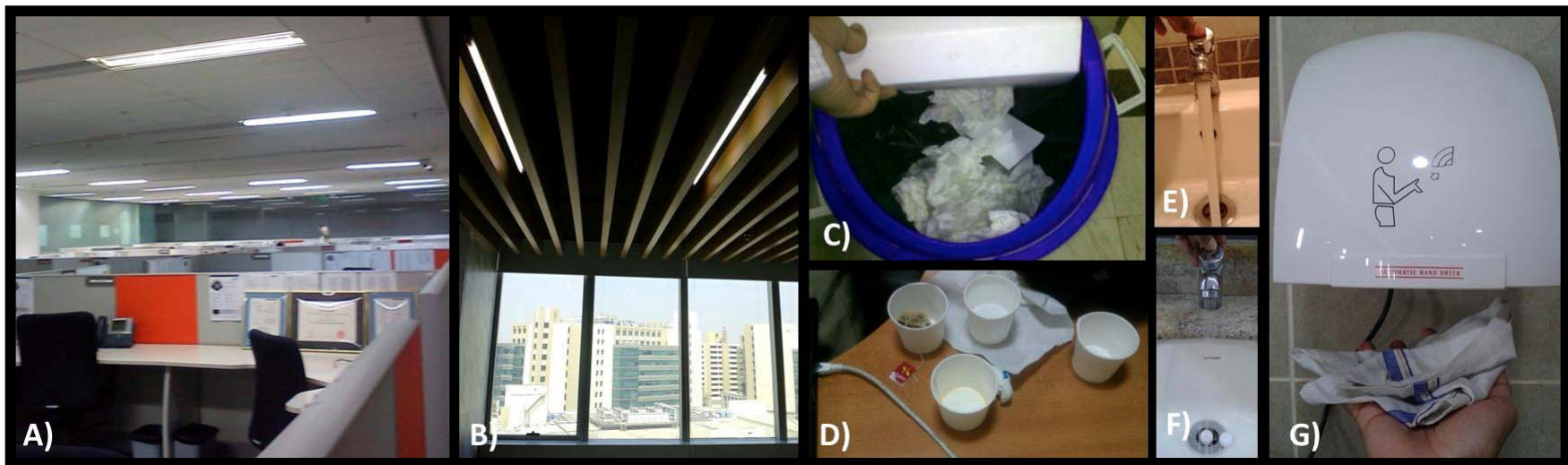


# METHOD

## I. Photo Elicitation Study

1-2 weeks to take pictures (M=5) with phone showing  
*“conservation or wastage of resource”*

Semi-structured interviews



## II. Focus group with Facility Team members

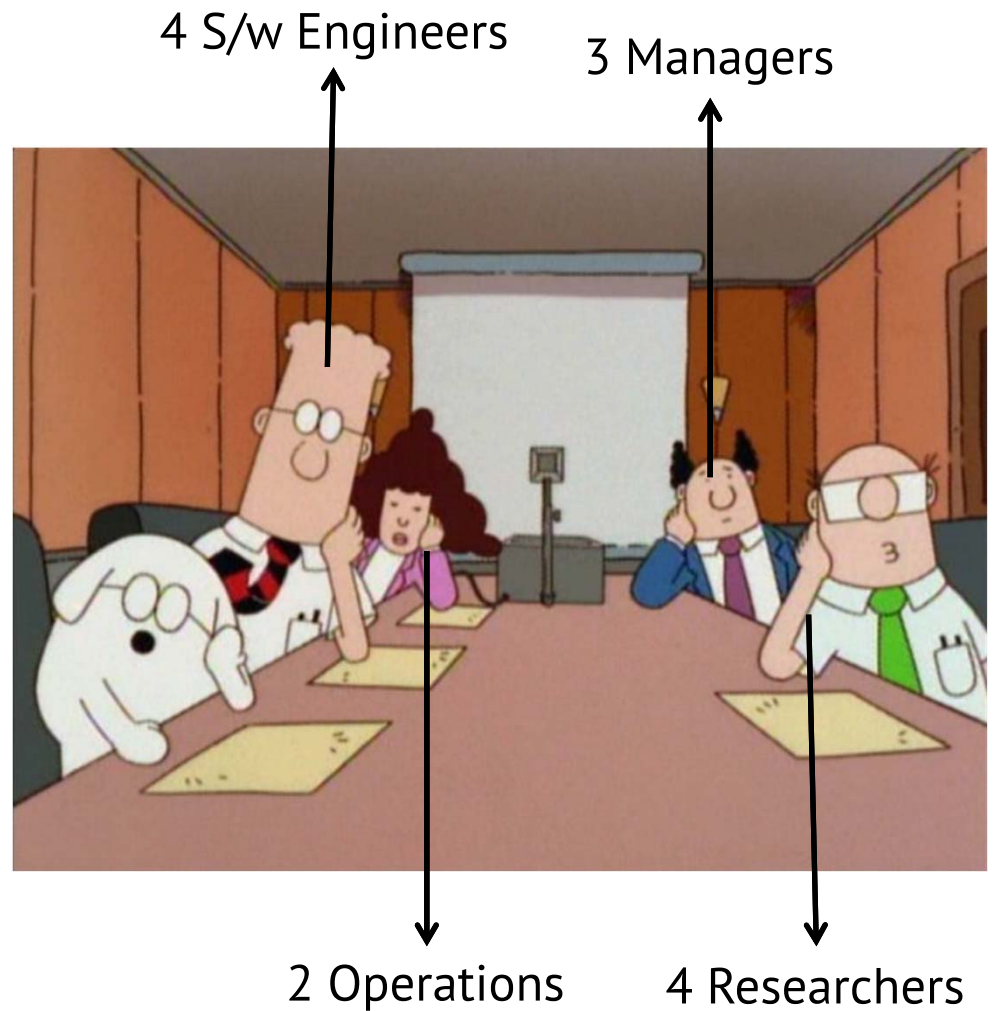
# DEMOGRAPHICS

13 IT Employees  
2 females, mean age=32.9

4 Facility Team (FT)  
4 males, mean age=31.8

9 married, 8 w/ children  
8 grad and 9 under-grad  
degrees

Spent ~9.2 hours in office daily





# RESULTS Summary

**Motivation** Scarcity, Learned Reactions, Money, Knowledge

**Kind of Wastage** Energy, Water, Fuel, Paper, Food

**Barriers** Lack of ownership, Volunteer's Dilemma, Money, Lack of Knowledge

**Potential Solution** Feedback, Incentives, Controls

**Design Considerations** Paradox of Choices, Location Specific Workplaces, Inconvenient Wasteful Actions

# MOTIVATION

## SCARCITY

*“In my childhood days... I saw people fighting for that (waste) food.” – P2*

## PEER-GROUP EFFECT

*“Having people around who are pro-environment does influences me.” – P6*

## KNOWLEDGE

*“Think about it, 150 liters (of water is consumed) per person per day. That’s a lot of water man!” – P8*

## MONEY

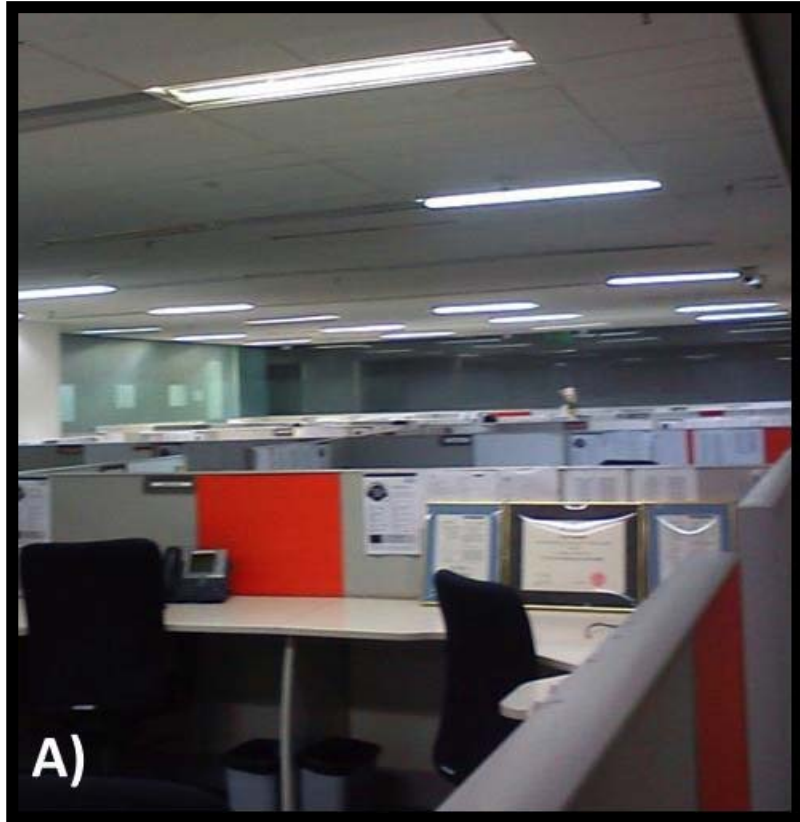
*“Switching off the lights, I don’t think anybody does (it) because of love for the environment... It’s all about finances.” – P3*

## LEARNED REACTIONS

*“It’s about good habits and knowing that we should not waste... That’s the way we have been brought up.” – P6*

# ENERGY Lights

Non-functional light sensors (P12)



Lights are ON irrespective of natural sunlight (P8)



*“There are (lighting) standards that we are supposed to maintain. We can’t go below that. It is from OSHA, a US standard, as this is a US company” – FT*

# ENERGY HVAC

*“HVAC consumes about 50-60% of the total building energy”. – FT*



*“We don’t need air conditioning, why are they providing us?” – P4*



Participants were not aware of the initiatives taken by the FT to make HVAC more efficient

# WATER



Employees use “*running taps to wash their face, hands and everything*” – P2, while at home, mugs are used instead to conserve water usage



Water flow restrictor, “*If the tap is giving 100% flow of water, by putting this restrictor about 40% of water comes*” – FT



Water wastage in workplaces are not visible, such as for cleaning and cooling purposes, “*in chillers (HVAC) and other things which I don't see*” – P4

# FUEL



*“it usually has only 4-5 people (while the capacity is of 16 people).” – P13*

Poor (safety and timing)  
public transportation  
system

No car-pooling

# PAPER



Wastage of multiple paper cups/day:  
*“I have at least three tea per day.” – P1*  
*“it’s so hot, you need one more cup to hold it.” – P10*



*“There is always a pile of uncollected printouts.” – P1*

# PAPER

Trash bin full of paper towels (P13)



Confused between similar options (hand air dryer vs paper towels)



Using hand air dryer to dry handkerchief, instead of using paper towels (P7)



# FOOD



*“Food is something that I unfortunately tend to waste because... the food here is very spicy.” – P10*



Food posters in café have not been very effective, lack “very explicit messages” about actions to take (P4)

# BARRIERS

## LACK OF OWNERSHIP

*“Ownership is major... I have to do something to save, that sense of ownership is missing.” – P2*

*“There are no distributed controls for cooling... So, you cannot do anything about it at an individual level... **We are not in the loop.**” – P4*

## VOLUNTEER’S DILEMMA

*“(Lets say) I save energy. But someone else uses lot of that energy which I saved.” – P2*

## FINANCIAL FREEDOM

*“I don’t feel like saving (in office) because... it won’t be reflected on my bills.” – P5*

## INFORMATION GAPS

*“I don’t know what kind of wastage happen here” – P11*

## BUREAUCRACY

*“Proposals takes time for approval... We need to forward these proposals to design team, then energy management teams... Finally it comes through RESO.” – FT*

# POTENTIAL Q / SOLUTION

What

could an organization give (or take away?)

feedback an organization can provide

role manual controls or automation can play

to motivate employees to conserve?

# DESIGN CONSIDERATIONS

## Manage the Paradox of Choices



Reduce choices by completely replacing inefficient options with the most environment-friendly option.

*E.g.*

instead of displaying posters advocating NO paper cups usage, removing paper cups altogether;

hand air dryer vs paper towels



# DESIGN CONSIDERATIONS

## Make Wasteful Actions Inconvenient



Design systems that impose additional user efforts to waste resources

*E.g.*

segregating printers based on the number of printouts that can be taken, such that heavy duty printers are placed farther from the sitting area

elevators waiting to be filled with a threshold number of people

# DESIGN CONSIDERATIONS

## Make the Roles of Others Visible



Provide visibility to peer's and FTs actions

# DESIGN CONSIDERATIONS

## Design Location Specific Workplaces with Communal Spaces

Lighting standards and cooling comfort level should follow local standards such as LEED for India



## Develop Home-like attitude

Ways for employees to develop similar attitudes to the work environment and their colleagues as they do to their home and family



How work life at "family-oriented" businesses differ from those at corporations?



# CONCLUSION

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# THANK YOU!

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