

*"I like to see a man proud of the place in which he lives,
I like to see a man live so that his place will be proud of him."
- Abraham Lincoln*

Green Interiors for Greener Earth

...Can be achieved, just by doing things the right way!



VENUS



Prakruthi
Interior Designers

Interior Design . . .



Is it really required?

- What is Interior Design?
- How many Engineers/Architects involve Interior Designers at the Design Stage?
- Can Interior Design create green spaces?

Interior Design



- ❖ Making Interior spaces efficiently functional by designing and providing
 - Space Plan
 - Fenestration and Ventilation Plan
 - Electrical Plan
 - Passive Cooling/Heating
 - Plumbing Plan
 - Furnishing & Colour schemes

Designer or Decorator?

Importance of Space Planning . . .

Mean it when you green it!

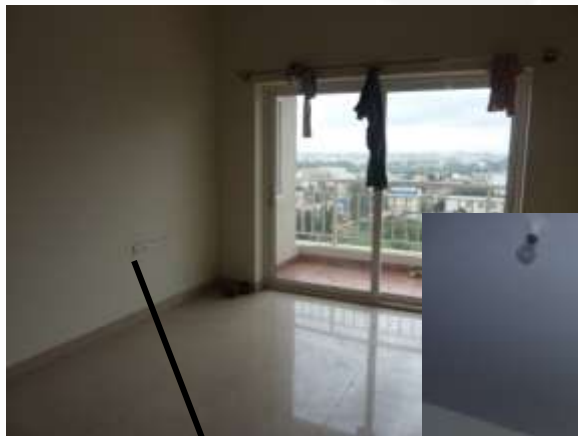


Bringing In Interior Designers at the right stage ...



House done without Space Planning by an Interior Designer

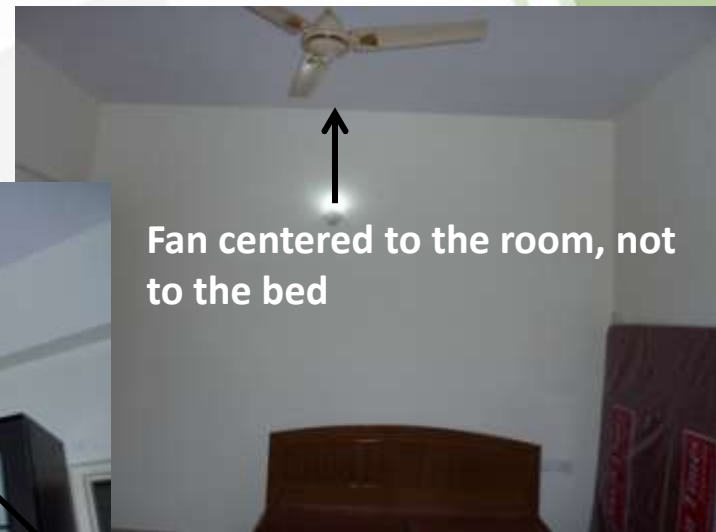
Most of the times, Interior Designers are approached after the whole structure is up, for choosing the finishes. This is the job of a **Decorator** and not a **Designer**



TV Point next to a French Window ... Glare?!!!



By interior design on the drawing board, this could be avoided



Fan centered to the room, not to the bed

Ventilation and Fenestration Planning

Little drops of water make a mighty ocean!

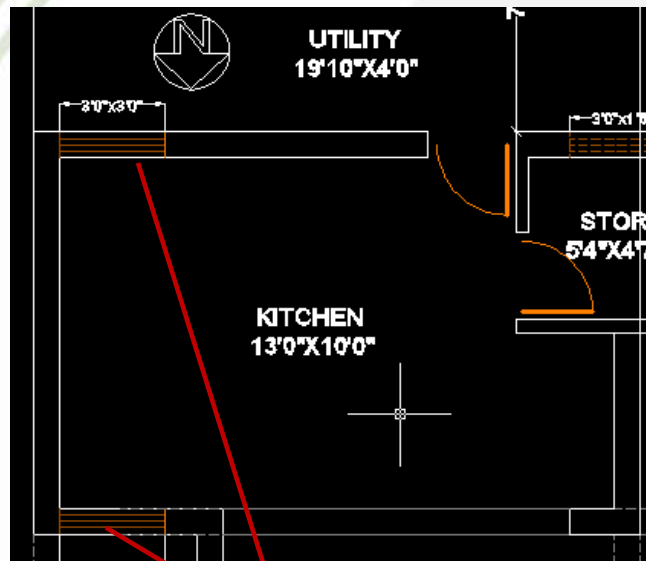


Plan By an Engineer, No Interior Designer Consulted yet



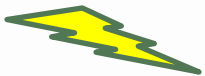
Numbers ...

- Average Time spent in the kitchen in the morning 1.5 hr
- Light needed to illuminate this area with CFL – 40 W
- If windows are not functionally placed - In a typical case like this, we will be using $40W \times 1.5 \text{ hr} = 60W\text{Hour/day}$ of power. This is 1.8 kWhr/month . This is 21.6 kWhr/year
- This is just one area of a typical middle class house. By scaling up, we can see how much power can be saved by planning fenestration based on the functional requirement of the space.



Windows placed before
Space Planning

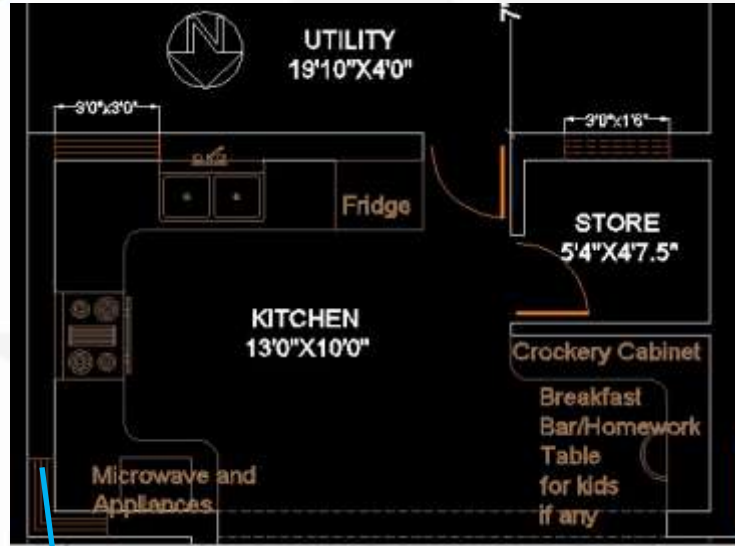
21.6 kW Hr/Year
wasted on lighting



Bringing In Interior Designers at the right stage ...



Going Green ...

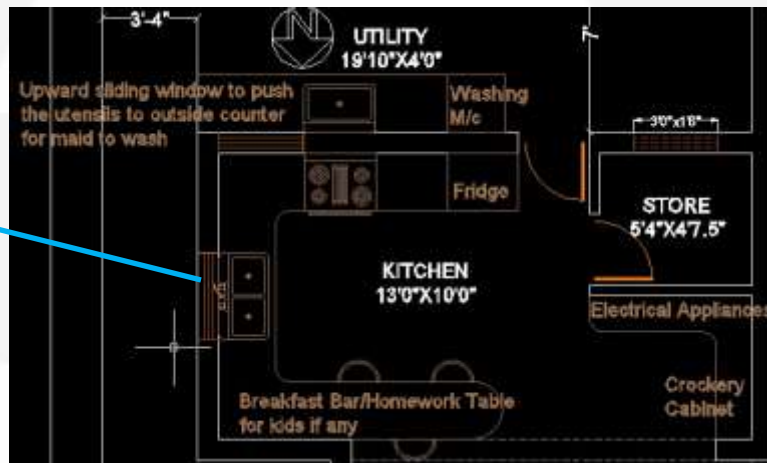


Option 1

**Saving of up to
21.6 kW Hr/Year**

Every Watt saved is a drop of green to our Mother Earth!

Proposed Location of windows by Prakruthi to take advantage of morning Sun



Option 2

Electrical Planning

Green should become the way of life



Implemented By an Electrician

Positioning of Fan



Numbers ...

Person sleeping on the right will not get sufficient air

- Results in increased fan speeds

- Wattage

High Speed: 63 Watts

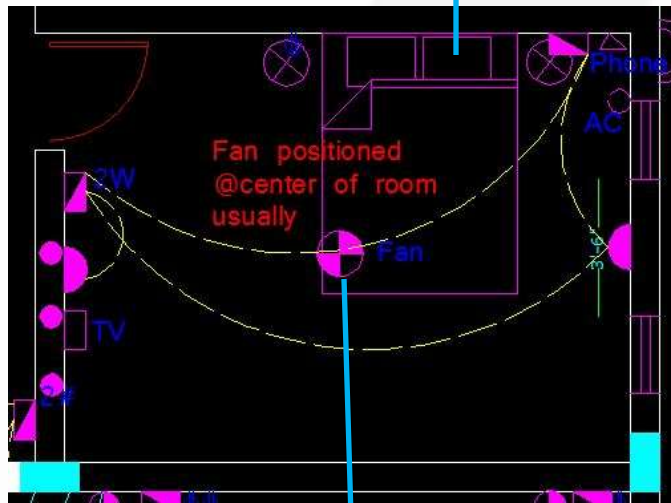
Medium Speed: 42 Watts

Low Speed: 15 Watts

- Instead of medium speed, if the fan has to run on high speed, the difference in power consumed is 21 WHr

- 7 Hours/day will be 147 WHr/day, which is 4.417 kWhr/Month, 53kWhr/Year

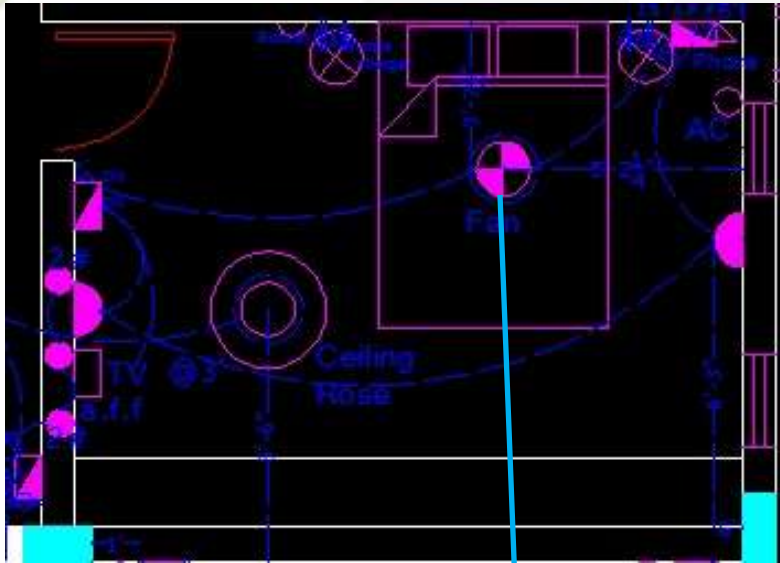
- This is just from 1 bedroom of a house



Fan positioned at the centre of the room

Bringing In Interior Designers at the
right stage ...

Going Green ...



Saving of up to
53 kW Hr/Year

Fan position moved
according to the
placement of bed

A typical 2 bedroom Flat ...

House done without Space Planning
by an Interior Designer

Numbers ...

- Results in increased fan speeds

- Wattage

High Speed: 63 Watts

Medium Speed: 42 Watts

Low Speed: 15 Watts

- Instead of medium speed, if the fan has to run on high speed, the difference in power consumed is 21 WHr

- 10 Hours/day will be 210 WHr/day, which is 6.3 kWhr/Month, 75.6 kWhr/Year



Fan, not catering to the dining area

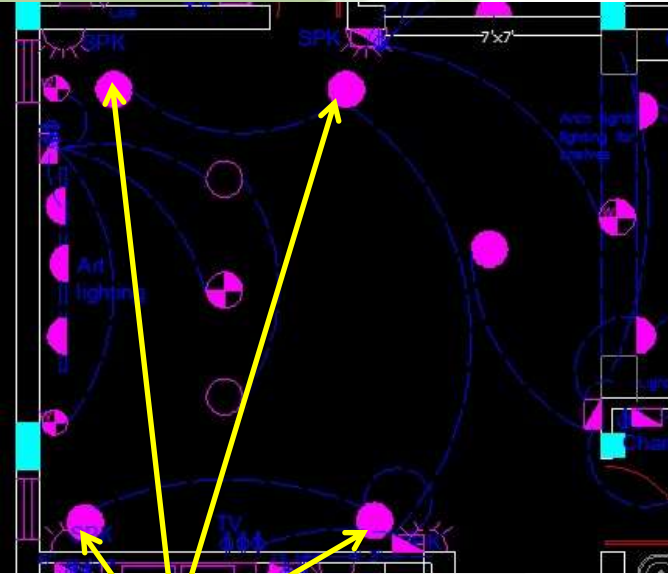
Fan, not catering to the seating area



**Saving of up to
75.6 kW Hr/Year**

Implemented By an Electrician

Positioning of Ceiling Lights



Conventional
Location of
ceiling lights
at the corners
of a room by
the electrical
contractor



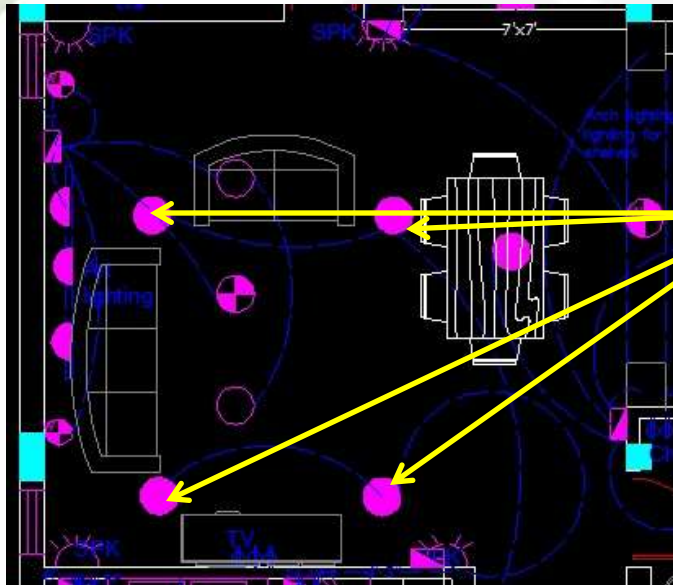
- As per electrician, these are decorative lights
- These LED Ceiling fixtures can be both general purpose and decorative lighting as well.
- But being placed in the far corner of the rooms, **waste of energy.**

Interior Designer's Recommendation

Positioning of Ceiling Lights

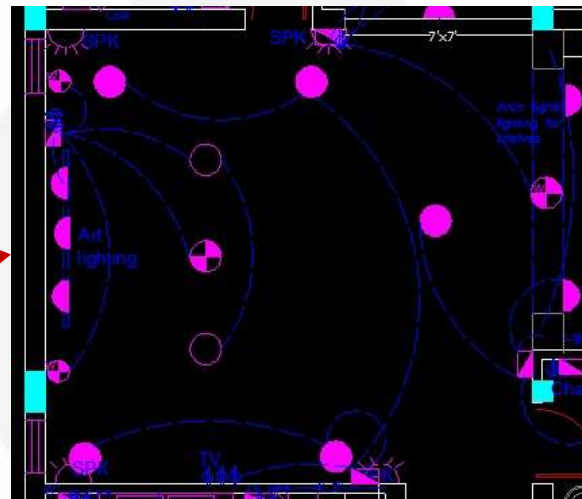


Lighting based on Space plan



Lighting based on seating arrangement – more **functional** as opposed to **corner placement**

After space planning, more lights will be required to fulfill the lighting requirement of people being seated



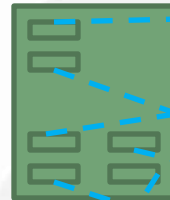
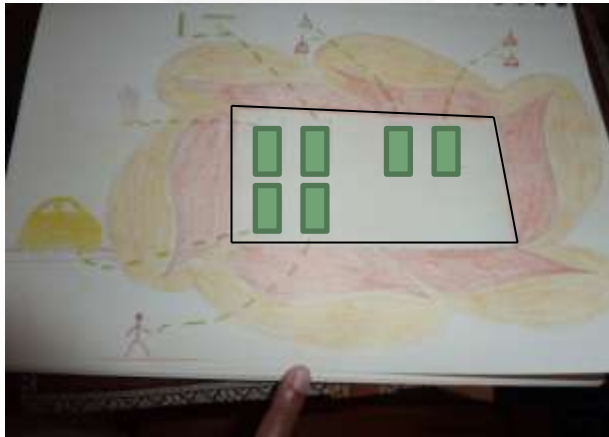
Switching Layouts



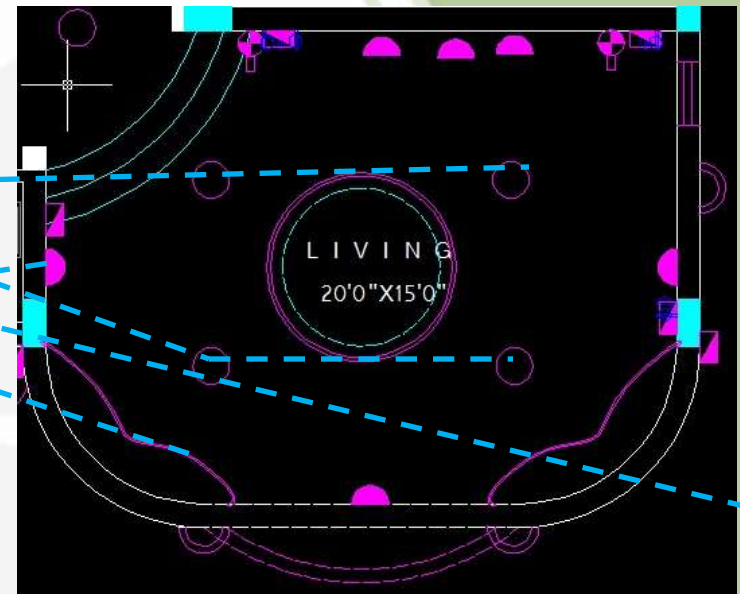
Too many switches ...

Results in too many On and Off switching

The **lifespan of CFLs reduces** by up to **85 %** if they are switched off and on too often



Master Switch for lights on Driveway



Master Switch for lights on Walkway

User Intuitive Switch Layout

Wall art showing switching layout!

Functional Art!

Passive Cooling/Heating

Ancient techniques still make sense!



Blocking the heat, not the Light



Chajjas longer than usual to reduce heat gain

Functional Cool roof for the bed room – Solar PV Panels

Vertical Fins to reduce heat gain

All the contours generate shadows on the walls and result in reduced heat gain



White Exterior to reduce heat gain

Load Reduction



By applying the right passive cooling measures, the cooling load of the building can be reduced by over 50%

In the Case considered earlier –

- By proper electrical planning, if fans run on medium speed, energy consumed is 42W/hour
- Living Room 10 Hours/day will be 420 WHr/day which is 12.6 kWhr/Month, 151.2 kWhr/Year
- 2 Bedrooms, 7 Hours/day will be 588WHr/day which is 17.64 kWhr/Month, 211.68 kWhr/Year
- **Total Cooling Load = 362.88 kWhr/Year**
- By **passive cooling**, this can be reduced to **181.44 kWhr/Year**
- Money saved, **Rs 1088.64/Year**

AC Load Reduction



By applying the right passive cooling measures, the cooling load of the building can be reduced by over 50%

In the very hot months if AC is used in the bedrooms:

- Energy consumed for a small bedroom AC is 1.3 kW/hour
- 10 Hours/day will be 13 kWhr/day which is 390 kWhr/Month, 4680 kWhr/Year!
- 2 Bedrooms, will be 9360 kWhr/Year
- **Total Cooling Load = 9360 kWhr/Year**
- By passive cooling, this can be reduced to 4680 kWhr/Year
- Money saved, Rs 28080/Year

Room Size		BTU	kW
Sq. Ft.	Sq. m		
150	14	up to 5,000	1.3kW
165	15	5,200	1.5kW
216	20	6,000	1.75kW
350	33	8,000	2.34kW
425	39	9,000	2.6kW
500	46	10,000	2.9kW
640	60	14,000	4.1kW
900	84	15,100	4.4kW
1,110	103	18,000	5.2kW
1,170	109	18,500	5.4kW
1,435	133	22,000	6.4kW
1,672	154	25,000	7.3kW
1,960	182	28,500	8.35kW

Indoor Air Quality Improvement

Introducing selected flora indoors to drastically improve air quality

The Areca Palm (*Chrysalidocarpus lutescens*) in the living room eliminates CO₂ by converting it into Oxygen



Mother-in-law's tongue (*Sansevieria trifasciata*) known as the bedroom plant converts CO₂ to O₂ during night hours.

Money plant improves quality of indoor air by eradicating formaldehydes and other volatile chemicals present in it. It increases the productivity of indoor air by at least 20%.



Reduces *Sick Building Syndrome*, drastically bringing down employees taking sick day offs, thus saving costs



Benefits of Good Indoor Air



- Consider an office with 200 employees with an average individual salary of Rs 15000/month
- Say 2 employees fall sick due to sick building syndrome very day, Company will be losing Rs 1000/day
- This turns out to Rs 30,000/month and Rs 3,60,000/year!



Plumbing Planning

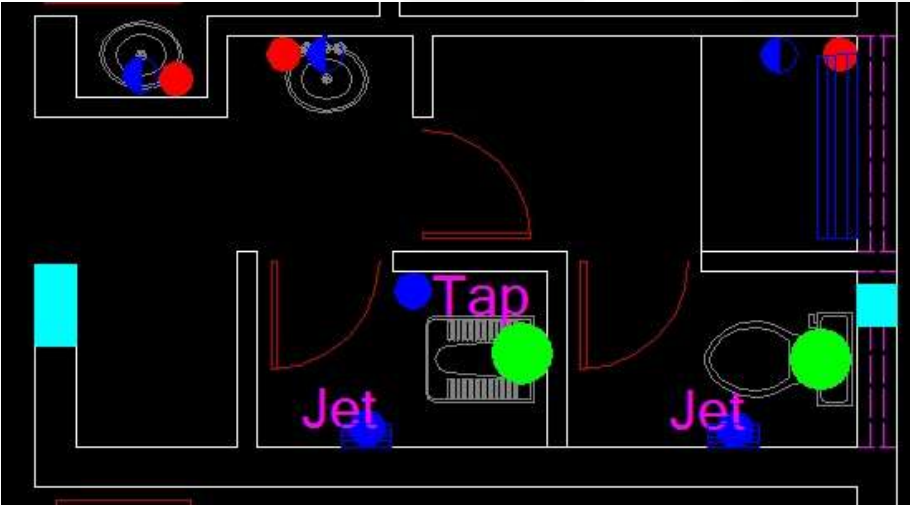
“Going green doesn’t start with doing green acts — it starts with a shift in consciousness. This shift allows you to recognize that with every choice you make, you are voting either for or against the kind of world you wish to see.”

— *Jan Somerhalder*

Plumbing Plans



Appropriate Plumbing plans for greywater and rainwater harvesting



-  Treated Grey Water
-  Normal Water - Cold
-  Normal Water - Hot/Cold
-  Grey Water Source (Collection points)
-  Drain Below Jet
-  Long Drain

Accidents in Bathrooms ...



How many accidents of old people slipping in bathroom have we heard?



Numbers ...

US Statistics - Every year about **235,000** people over age 15 visit emergency rooms because of injuries suffered in the bathroom, and almost **14 percent** are **hospitalized**.

More than a third of the injuries happen while bathing or showering due to slippery floors

For Indian population, this could be even more!



Circular Manhole Frame and Grating Cover

Common Drain

Discharge speed up to 0.3L/sec

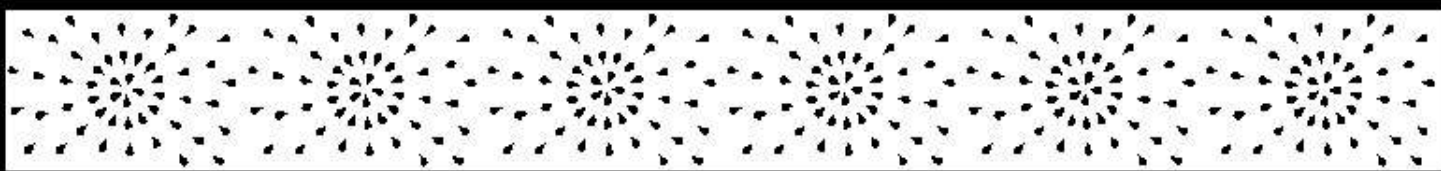
**Indirect savings
on medical bills,
time, stress &
pain!**

User Friendly Bespoke Solution



Long Drains

- For quick drying Bathrooms with more than twice the discharge speed of conventional drains
- Can be designed to match the theme



Drain Plate with water-drop shaped holes

Discharge speed $> 0.6\text{L/sec}$

Mitigating Cost of Living



Accidents

- An accident at home can cost a family up to Rs 1Lakh. Even if we take 1 accident in five years, the savings is huge!



Savings & ROI

Reduce Reuse Recycle



Savings in a typical 2 Bedroom House



Tangible Benefits

SI No	Area	Potential kWhr saving/Year	Money Saved
1	Living Room - Fans	151.2	Rs. 907.20
2	2 Bedrooms - Fans		Rs. 0.00
3	Living+Bedrooms Passive Cooling	181.44	Rs. 1,088.64
4	Kitchen - Lighting	21.6	Rs. 129.60
5	Living Room - Lights	64.8	Rs. 388.80
6	Bedrooms - Lights	32.4	Rs. 194.40
7	CFLs Freq switching due to more no. of switches		Rs. 1,500.00
8	AC Loads 2 Bedrooms	4680	Rs. 28,080.00
	Total Savings kWhr/Year	5131.44	
		Total Savings/Year	Rs. 32,288.64
	Money Saved in 5 Years Rs	Rs. 161,443.20	
	Carbon Savings	3.4893792 MT/Year	

Scale this up to a community, city, state & country

Intangible Benefits



A building's interior has the greatest positive impact on the health, wellbeing and performance of its occupants

- More natural light
- More fresh air
 - These promote healthy environment
- Naturally cool/hot
- Reduced accident risk
- Comfort and convenience in day to day activities

**Yes, proper Interior Design can
create Green Spaces!**





"Too much green, too much happiness"

Mehmet Murat ildan

THANK YOU



VENUS



Prakruthi
Interior Designers