

# SMALLER FOOTPRINTS

## FROM MEGAWATTS TO KILOWATTS

# HOUSEHOLDS

are responsible for

**70%** OF PRIMARY ENERGY CONSUMPTION IN **INDIA**

Source : An energy analysis of household consumption by Shonali Pachauri

# ZERO TO KILOWATTS

















# WORLDWIDE, BUILDINGS ACCOUNT FOR...

17% fresh water withdrawals

25% wood harvest

33% CO2 emissions

40% material & energy use



**Indian Housing Census of 2007 – 80% of construction is still Ground+1 homes or related buildings..**

# COMPARISON OF EMBODIED ENERGY IN WALLS

Wall made up of concrete blocks plastered and painted

100 sft. of

Wall--- 1312.5 MJ

Plaster both sides--- 864.0 MJ

Paint--- 648.0 MJ

Total--- 2824.5 MJ

Wall made up Stabilized Mud Blocks

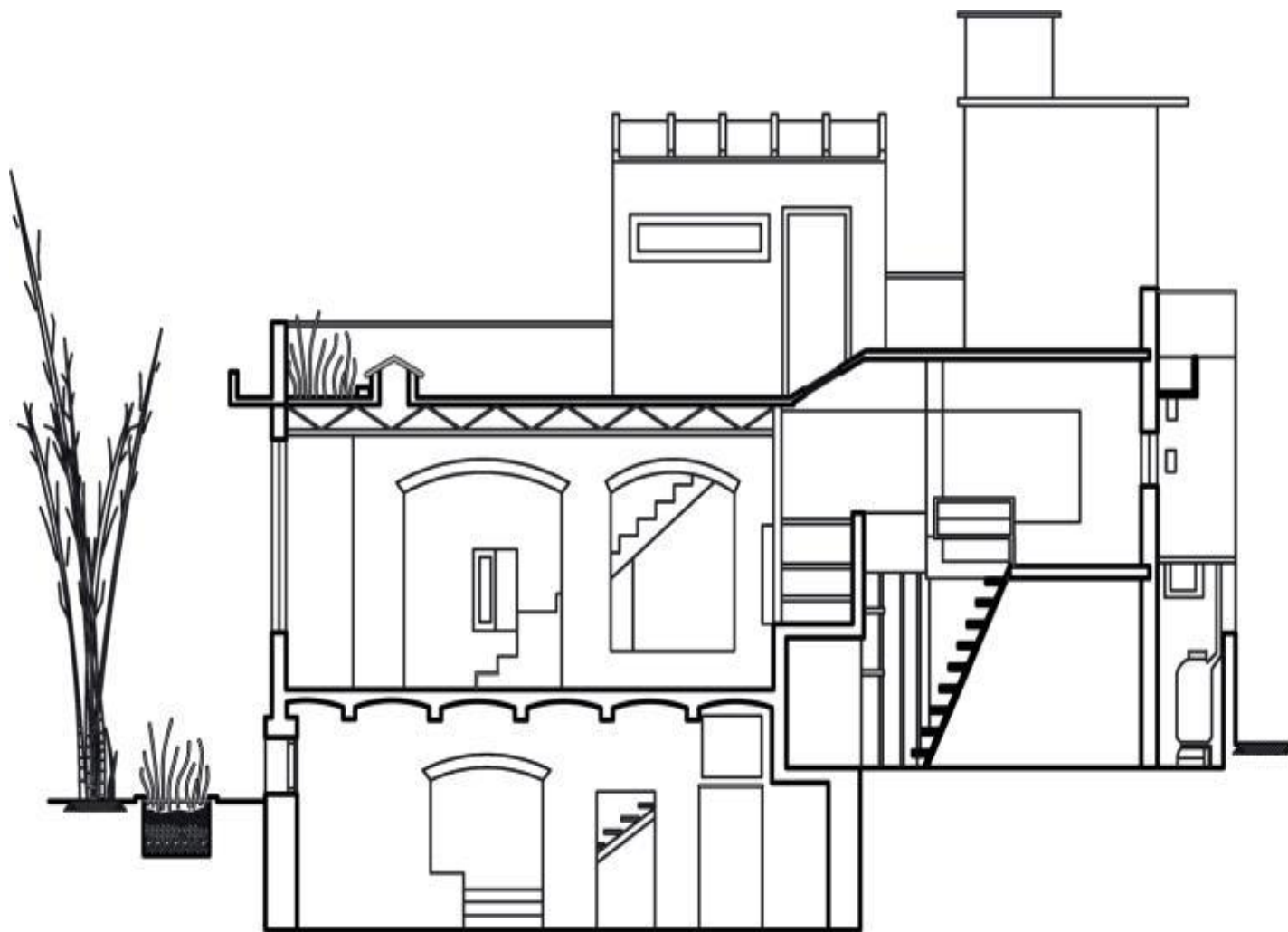
100 sft.of

Wall--- 1237.5 MJ

Total--- 1237.5 MJ



# KILOWATTS TO ZERO



SECTION







EXTERNAL  
TEMP: 31.0

GROUND FLOOR  
TEMP: 28.0

BASEMENT FLOOR  
TEMP: 22.0

BASEMENT GAVE  
THE MUD FOR THE  
STABILISED MUD  
BLOCKS

LIVING AREA

SKYLIGHT

COMMUNITY  
RECHARGE  
WELL

EXTERNAL  
TEMP. 32.0

GROUND FLOOR  
TEMP: 24.0

BASEMENT FLOOR  
TEMP: 22.0

BASEMENT GAVE  
THE MUD FOR THE  
STABILISED MUD  
BLOCKS

LIVING AREA

SKYLIGHT

COMMUNITY  
RECHARGE  
WELL

# Bangalore

A roof story





©2008 Europa Technologies  
Image ©2009 DigitalGlobe

©2008 Google

Eye alt 10354 ft

12°55'02.46"N 77°36'35.32"E

elev 2975 ft

May 17, 2007





Un-designed-  
a roof is a sterile space and a heat sink



# A smart roof

Receives maximum sunlight and heat

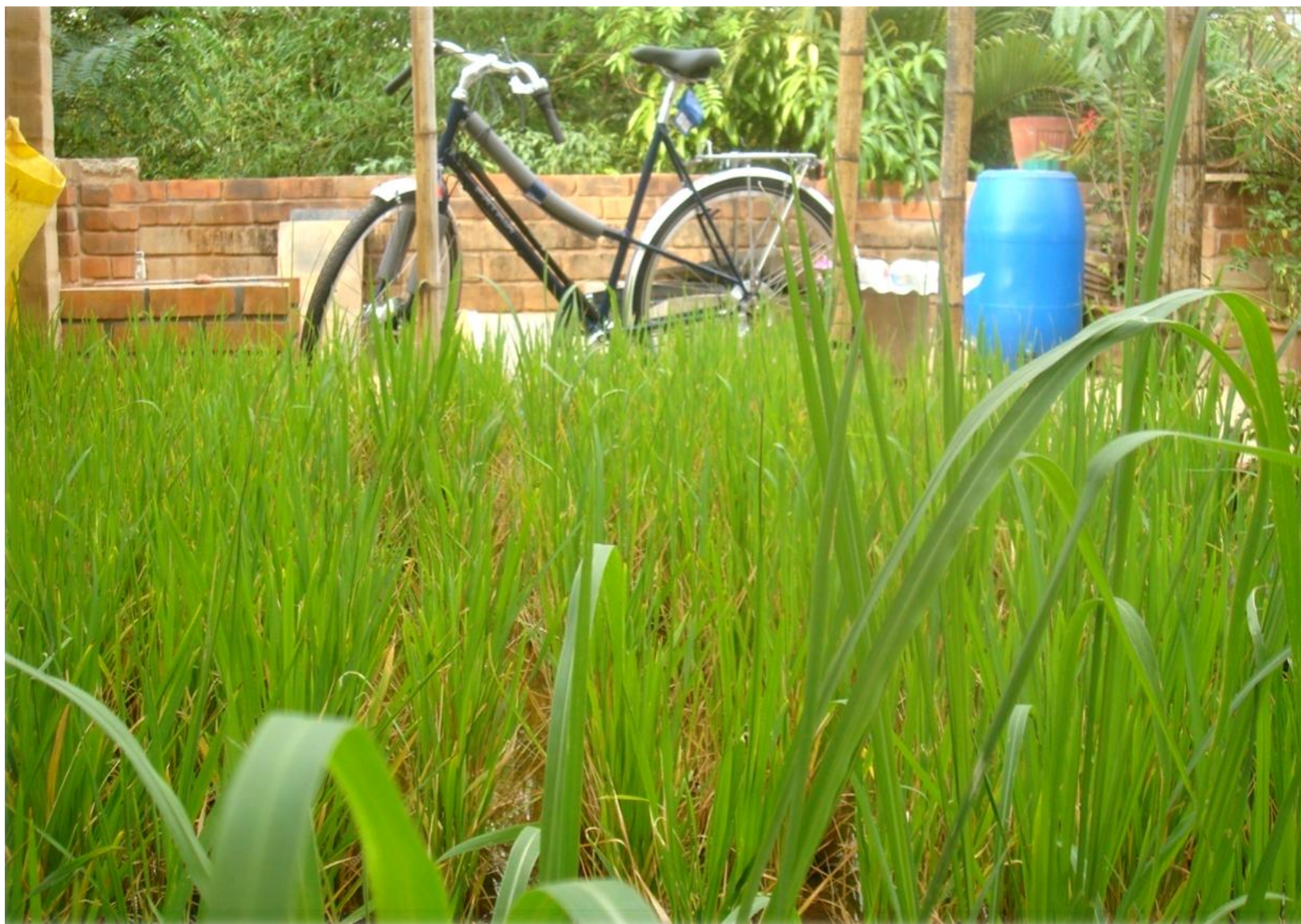
All the rain

Lots of wind

A whole bunch of birds, butterflies and bees

Can solve Bangalore's water, wastewater, energy,  
sewage, food and bio-diversity problem















# Uses the Sun





# Turns sewage to a nutrient through Eco-san



# What can a smart roof do?

## Provide

Food security... and grow rice, banana

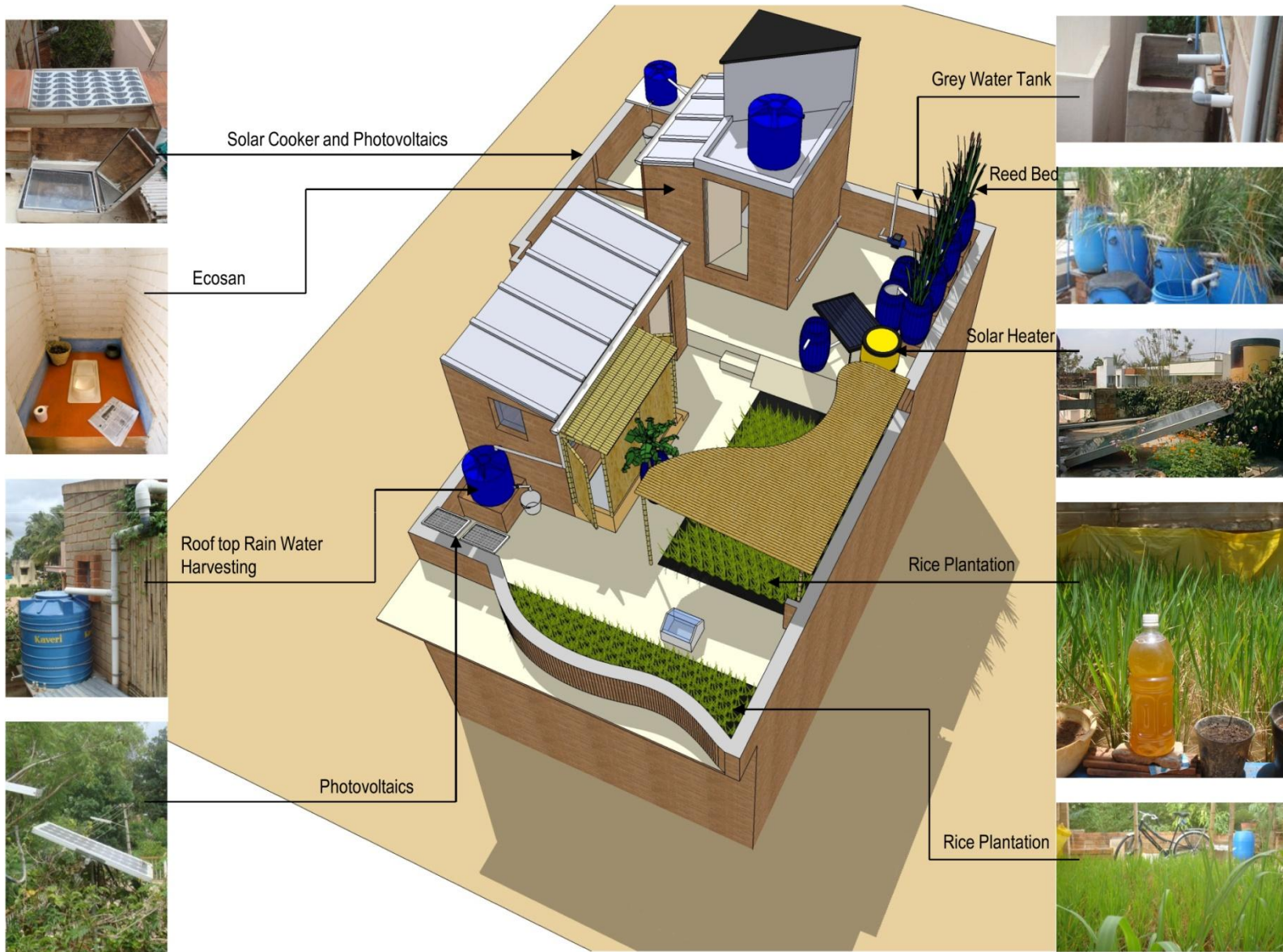
Water security .. And treat waste water

Energy security... and keep the house cool

Ecological security... and help save the sparrow

50% of built Bangalore are roofs.

What do we do about them? Heat sinks or Ecological spaces-  
The choice is ours.













**GREED**  
**CANNOT**  
**BE GREEN**