

# **SOIL AND WATER CONSERVATION IN RECHARGE AREA UNDER**

by

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# NEED OF SOIL

- Providing fertility, nutrients, and a foothold for plants and crops.
- Retaining water and regulating the discharge of excess rainwater, preventing flooding.
- Filtering and purifying water, buffering against pollutants, and protecting groundwater quality.
- Sheltering animals and hosting a microbial environment.
- Source of valuable minerals, medicines, and organic fuels.
- Decomposing waste and recycling nutrients.
- Allowing gas exchanges between land and air.

# Human Body Water Composition By Organ/Tissue



**Brain**  
85%



**Heart**  
77%



**Lungs**  
80%



**Teeth**  
10%



**Liver**  
73%



**Bone**  
22%



**Kidneys**  
80%



**Muscles**  
73%



**Skin**  
71%



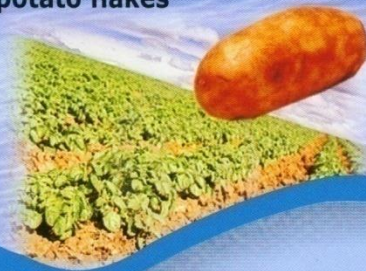
**Blood**  
79%

# Global average water footprint

**1300 litres of water  
for 1 kg wheat**



**900 litres of water for 1 kg  
potato flakes**



**3400 litres of water  
for 1 kg rice**



**1500 litres of  
water for 1 kg  
cane sugar**



**2700 litres of water for  
1 cotton T-shirt**



Save Water - Save the World

# Global average water footprint

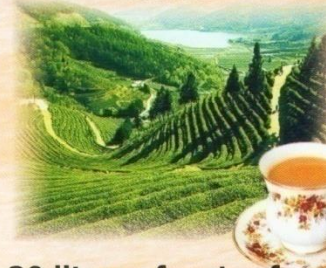


**140 litres of  
water for 1 cup  
coffee**

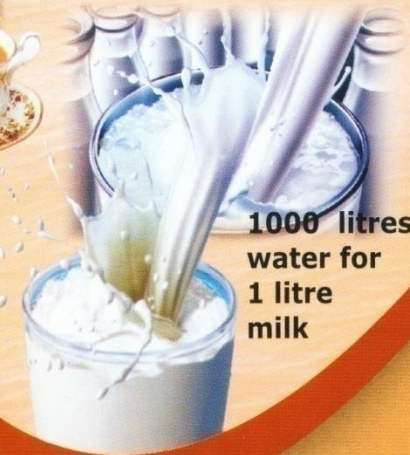
**5000 litres  
of water  
for 1 kg  
cheese**



**40 litres of water for 1 slice  
wheat bread**



**30 litres of water for  
1 cup tea**



**1000 litres of  
water for  
1 litre  
milk**

Today's Rain Water - Tomorrow's Life Saver

# Global average water footprint



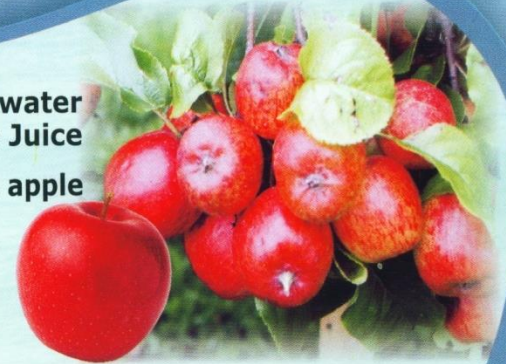
**2500 litres of water  
for 1 kg coconut**



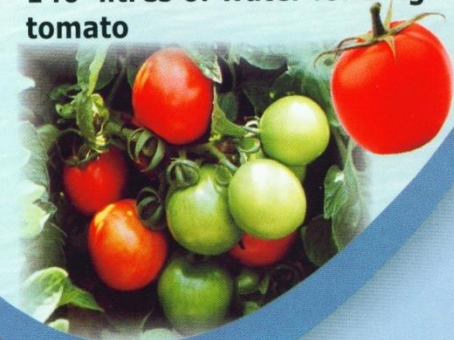
**190 litres of water  
for 1 glass Apple Juice**  
**70 litres of water for 1 apple**



**50 litres of water  
for 1 orange**




**140 litres of water for 1 kg  
tomato**




Save Water for our Children<sub>6</sub>


# Global average water footprint




**2800 litres of water for  
1 kg sorghum**



**900 litres  
of water  
for  
1 kg maize**



**1300 litres  
of water  
1 kg  
barley**



**1800 litres of water for 1 kg soyabeans**

Don't waste it - Just taste it

# Global average water footprint



**2400 litres of water for 1 hamburger**

**2400 litres of water for pure chocolate (100-gram bar)**

**170 to 310 litres of water for 1 soft drink (0.5 litres)**

**200 litres of water for 1 egg (60 gms.)**

Think a Life without Water

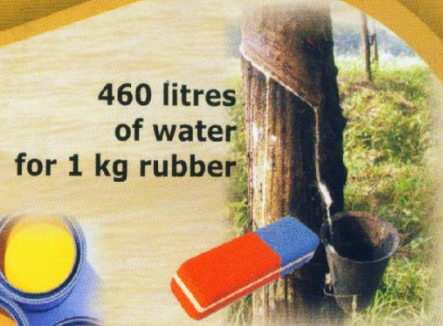
# Global average water footprint



**120 litres of water  
for 1 kg fertilizer**



**250 litres  
of water  
for 1 kg steel**



**460 litres  
of water  
for 1 kg rubber**



**16600 litres for  
1 kg leather**

**16000 litres of water  
for 1 microchip**



**410 litres of water  
for 1 litre paint**



**10 litres of water  
for 1 A4-sheet paper**

Every Drop Counts

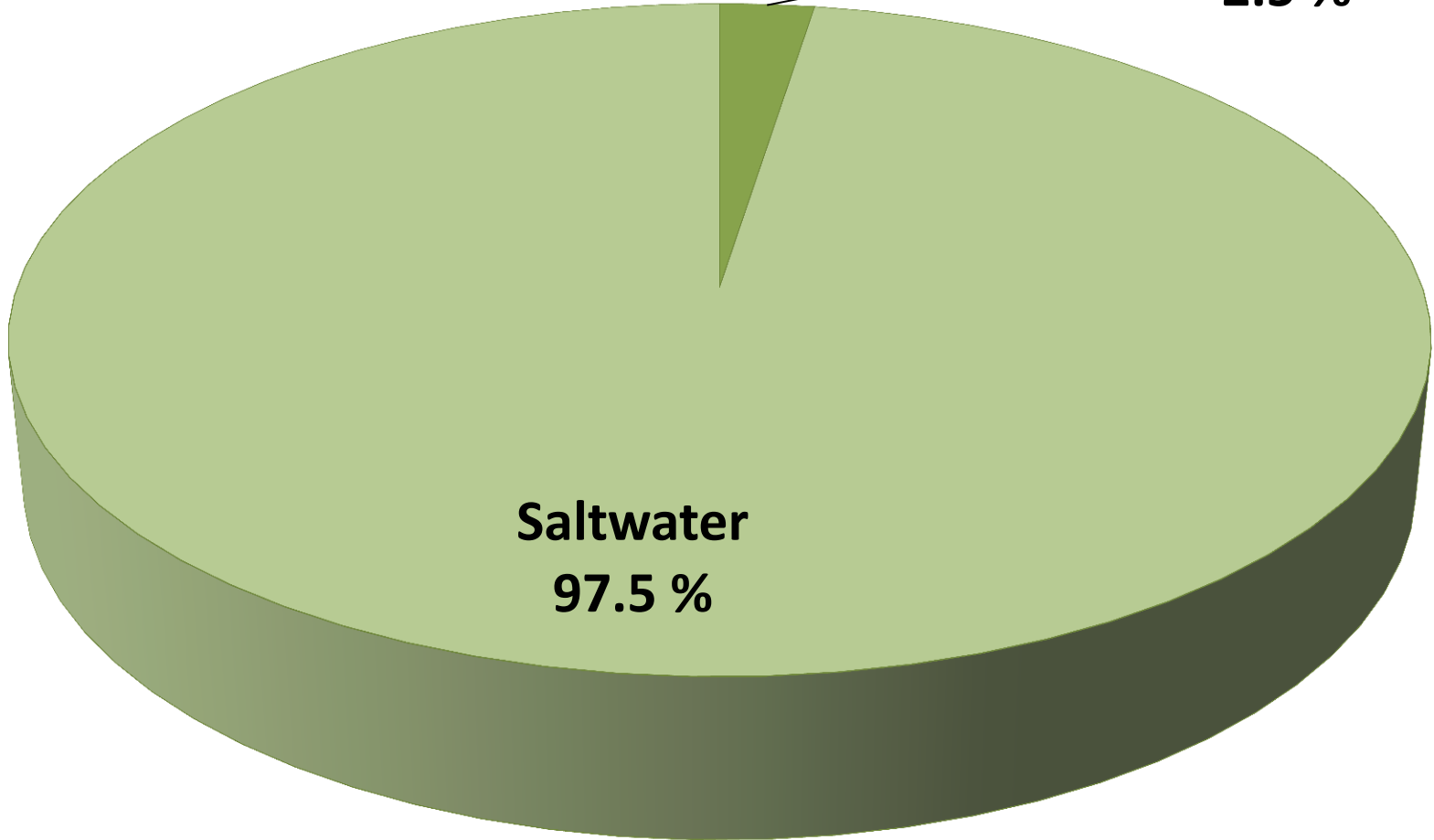
**TOTAL WATER**

**Fresh water**

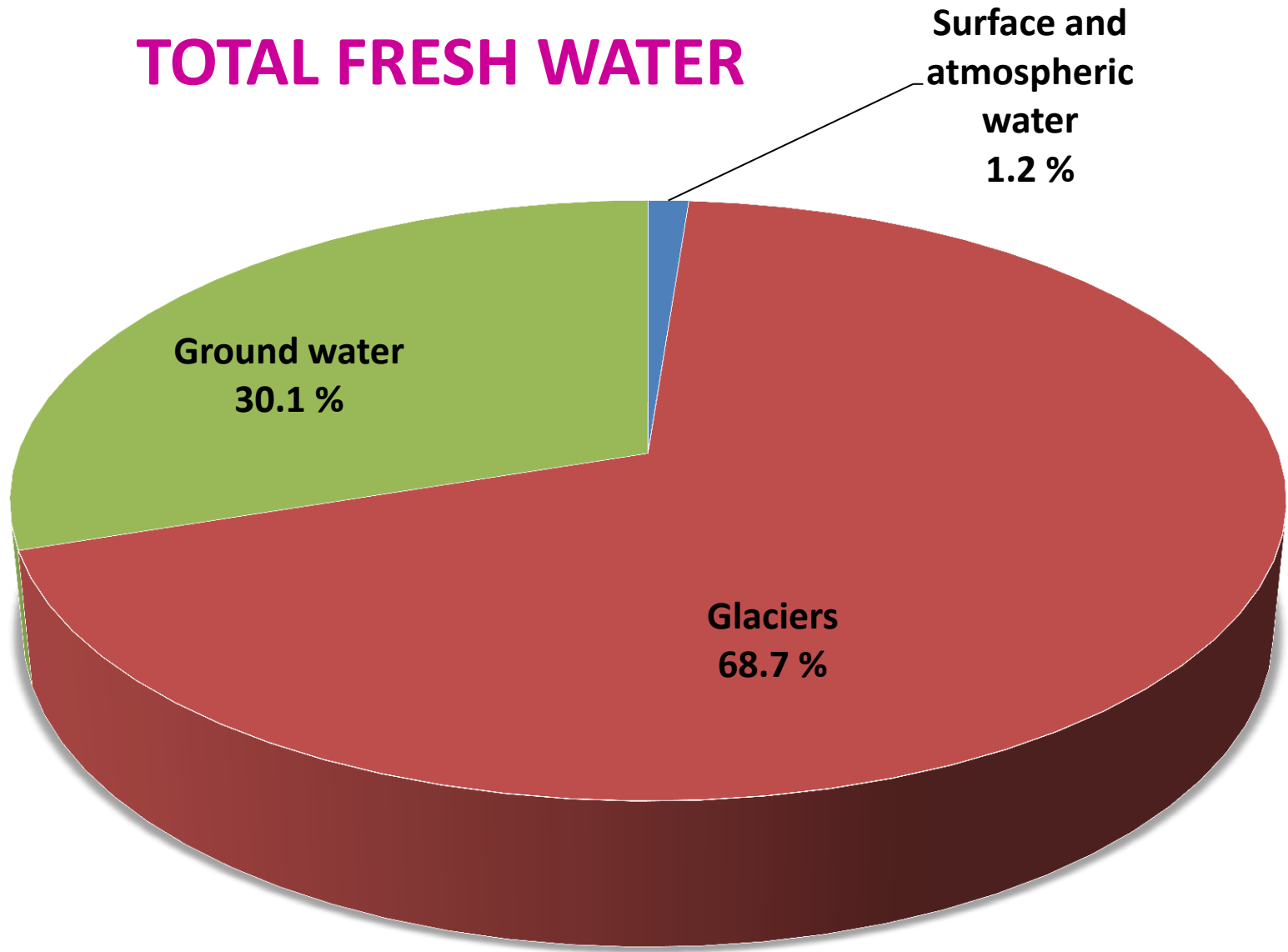
**2.5 %**

**Saltwater**

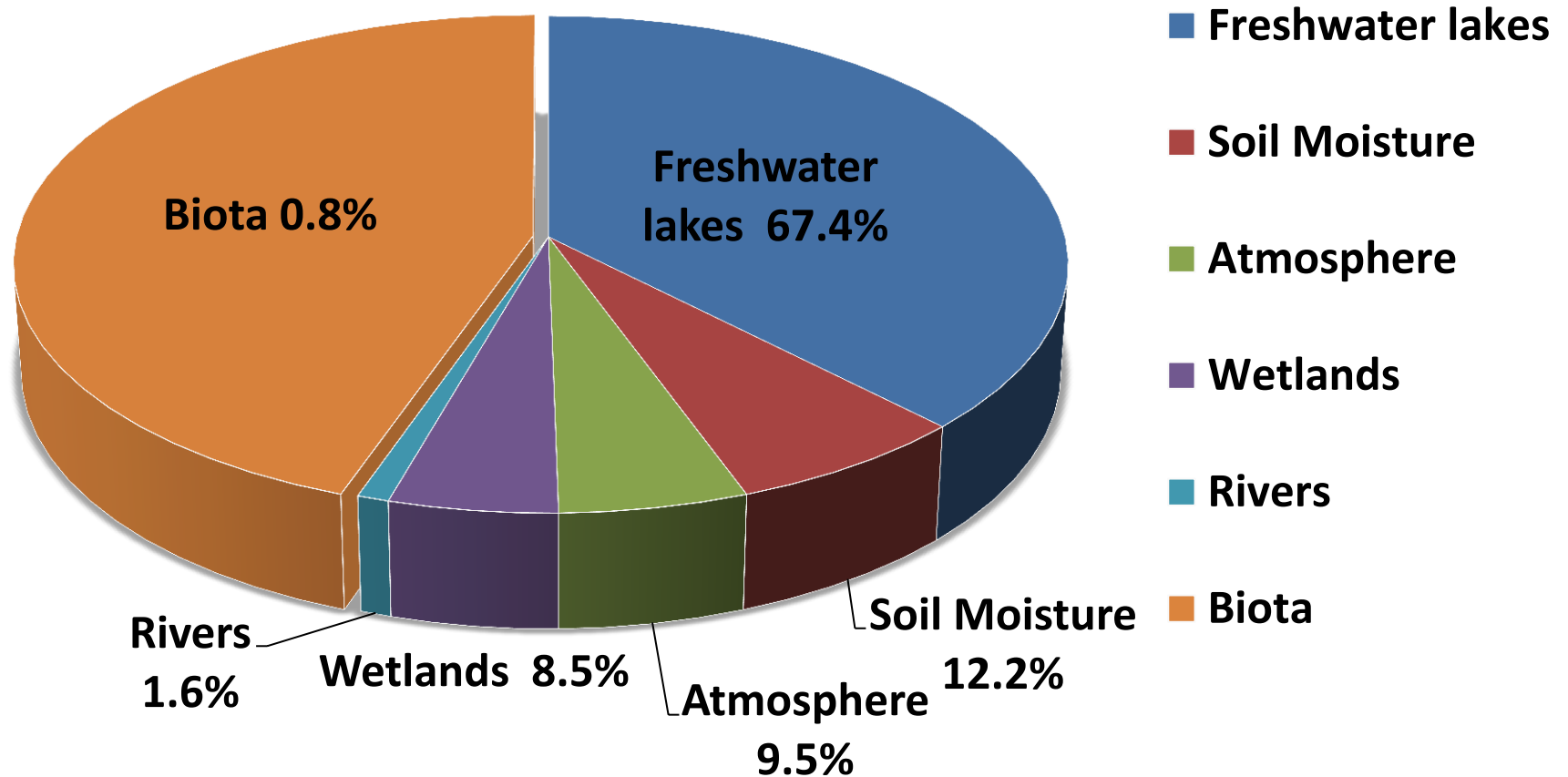
**97.5 %**



# TOTAL FRESH WATER



# SURFACE & ATMOSPHERIC WATER



# SOIL CONSERVATION

- Maintaining high productivity with minimum amount of soil loss.

## Objectives:

- Promotion of proper land use.
- Prevention of Soil erosion and restoration of the fertility of eroded land.
- Maintenance of soil fertility.
- Reduction of water runoff and regulation of water resources.

# WATER CONSERVATION

- Protect, Preserve, and control the usage of water and its resources. It is the system Introduced to manage freshwater, reduce the wastage and protect the water and its resources in order to reduce and to avoid the scarcity.

# Water Erosion



# Wind Erosion



# Over Grazing



# Depletion of forest Cover



# High sedimentation load in Rivers



# Depletion of Ground Water



# SOURCE SUSTAINIBILITY

- Sustainable Ground Water Management with Community Participation.
- Inculcate Behavioral Change in Ground Water Management
- Water Literacy
- Water Budgeting
- Demand and Supply
- Water Security plan (WSP)
- Convergence with ongoing Central and State Programme
- Gender based Issue
- Environmental Safe Guard

# DEMAND AND SUPPLY



# Water Conservation

- ❖ **In-situ water conservation**
  - a. **Agronomical measure**
  - b. **Engineering measure**
- ❖ **Direct Surface Run off- conservation**
- ❖ **Nalla/River-water conservation**



**In-situ Water Conservation**

# A-Agronomical practices:

- a. Contour cultivation
- b. Deep tillage
- c. Strip cropping (Contour, field, wind permanent or buffer)
- d. Inter or mixed cropping
- e. Green Manuring
- f. Crop Rotation
- g. Use of crop residue
- h. Mulching
- i. Relay cropping
- j. Seasonal crop cover
- k. Improved crop management practices

# Contour Cultivation



# Deep Tillage



# Strip Cropping

- ❖ Strip cropping is a method of farming used when a slope is too steep or too long.
- ❖ Strip cropping helps keep the soil in a long enlarge of land .
- ❖ This method becomes more effective for erosion control.
- ❖ The strip crops check the surface runoff and force them to infiltrate into the soil, thereby facilitates to the conservation of rain water.



# Intercropping



# Intercropping in Maize



# Cover Cropping

- ❖ Cover cropping is good ground cover by canopy gives the protection to the land and minimize soil erosion.
- ❖ Then conserving soil and moisture the cover crops hold those soluble nutrients, which are lost by leaching.
- ❖ The advantage of the of the cover crops is the addition of organic matter.
- ❖ The legumes provide better cover and better protection.

# Mulching

- ❖ Mulching of soil with available plant residues reduce soil loss considerably by protecting the soil from direct impact of raindrop and reducing the sediment carried with runoff.
- ❖ A minimum plant residue cover of 30 percent is necessary to keep runoff and soil loss within the acceptable limits.
- ❖ Vertical mulching also reduce soil loss and increasing.

# Use of Crop Residues



# GREEN MANURE CROPS



# Relay Cropping



## **B. Engineering measure**

# A-Bunding

- ❖ Field Bund
- ❖ Contour Bund
- ❖ Graded Bund
- ❖ Lateral Bund
- ❖ Stone Bund
- ❖ Marginal Bund
- ❖ Peripheral Bund
- ❖ Side Band: Side bunds are at the extreme ends of the contour bound running along the land slope.

# FIELD BUNDING

**Top width** - 0.30 M

**Bottom Width** - 1.35 M

**Height** - 0.45 M

**Side Slope** - 1.5:1



# Field Bund

<b>Top width</b>	- 0.30 M
<b>Bottom Width</b>	- 1.35 M
<b>Height</b>	- 0.45 M
<b>Side Slope</b>	- 1.5:1



# Contour Bund



**Top width** - 0.45 M

**Bottom Width**- 1.65 M-2.85

**Height** - 0.60 M

**Side Slope** - 1.0:1 to 2.0:1

**Cross** - 0.63 to 0.99 M.



Area when show is less than 6% annual vairfell is less than 850 mm.

# Lateral Bund



**Lateral bund are conserves between two side bounds along the slop for preventing con----- of wat at on side.**

# Stone Bunding



# Marginal Bund



**These bund are formed at the marginal of the field road, nalla, river etc to demarcate this boundrya.**

# Peripheral Bund



**Bund are constructed along field boundaries without -----to contour. They serve as fences and give protection from water and wind erosion.**

# B- Trench

❖ Staggered Trench

❖ Contours Trench

# Staggered Trench



# CONTINUOUS CONTOUR

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## **2. Direct Surface Run off- conservation**

# Direct Surface Run off-conservation

- ❖ Pond

  - Farm Pond

  - Pond

- ❖ Diversion channel

- ❖ Roof rain water harvesting

# Pond



SSW

2016/12/17 16:31

120m 0998hPa

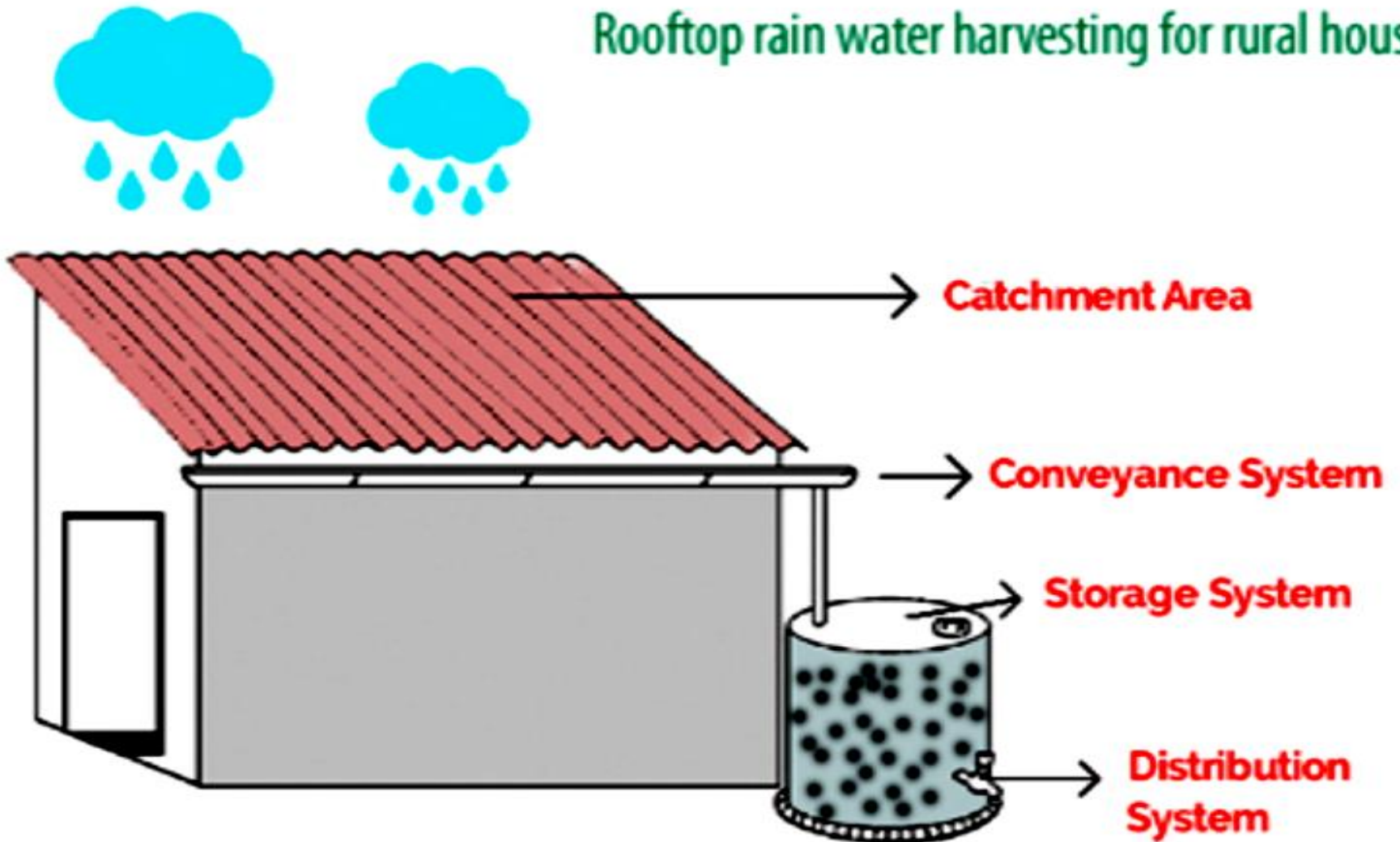
26°56'41"N 080°27'56"E

17.12.2016 16:31



# Rooftop water harvesting for rural house

Rooftop rain water harvesting for rural house



# Nalla/River-Water Conservation

- ❖ Gully control structure
- ❖ Earthen Check Dam
- ❖ Loose Boulder structure
- ❖ Rockfil Dam
- ❖ Earthen Gully plug
- ❖ Gabian Structure
- ❖ Check Dam
- ❖ Percolation tank
- ❖ Diversion Drain

# GULLY CONTROL WORK



# Check Dam



# Earthen Check Dam



# Loose Boulder Structure



# GABION STRUCTURE



# CHECK DAM



# PERCOLATION TANK



# SPRINKLER IRRIGATION





**Drip Irrigation System | Advantages | How to Install**