

Rain Water Harvesting



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Cluster 1

8th April 2021

Our Vision.....

“We will strive to be No. 01 Plantation Company A Model for Sri Lanka”

- 13 Estates situated in Low, Mid & Up Country.
- 8800 Ha
- 4 mn tea, 0.6 mn kgs rubber, 18 mn Oil palm, Cinnamon, Commercial forestry, renewable energy, ECO tourism
- 6000 employees
- 120% of energy requirement through renewable sources.
- **254 mn** liters of rainwater harvesting capacity.
- Our sustainability strategy “Haritha Shakthi” was recognized at 2018 best corporate citizen sustainability awards.



**Rainfall
pattern**

Water
Retention

**Improvement
of soil texture**

Water
conservation

6

**CLEAN WATER
AND SANITATION**



• RAINFALL PATTERN

- NUMBER OF WET DAYS
- DENSITY OF RAINFALL

• IMPROVEMENT OF SOIL TEXTURE

- GOOD AGRICULTURAL PRACTICES (GAP)

• WATER RETENTION

- DRAINING AND COMPOSTING, MULCHING

• WATER CONSERVATION

- **RAINWATER HARVESTING**
- PROTECTING GROUND WATER RESOURCES
- REDUCE THE WASTE
- OPTIMIZING WATER EFFICIENCY
- FORESTATION

SWMP



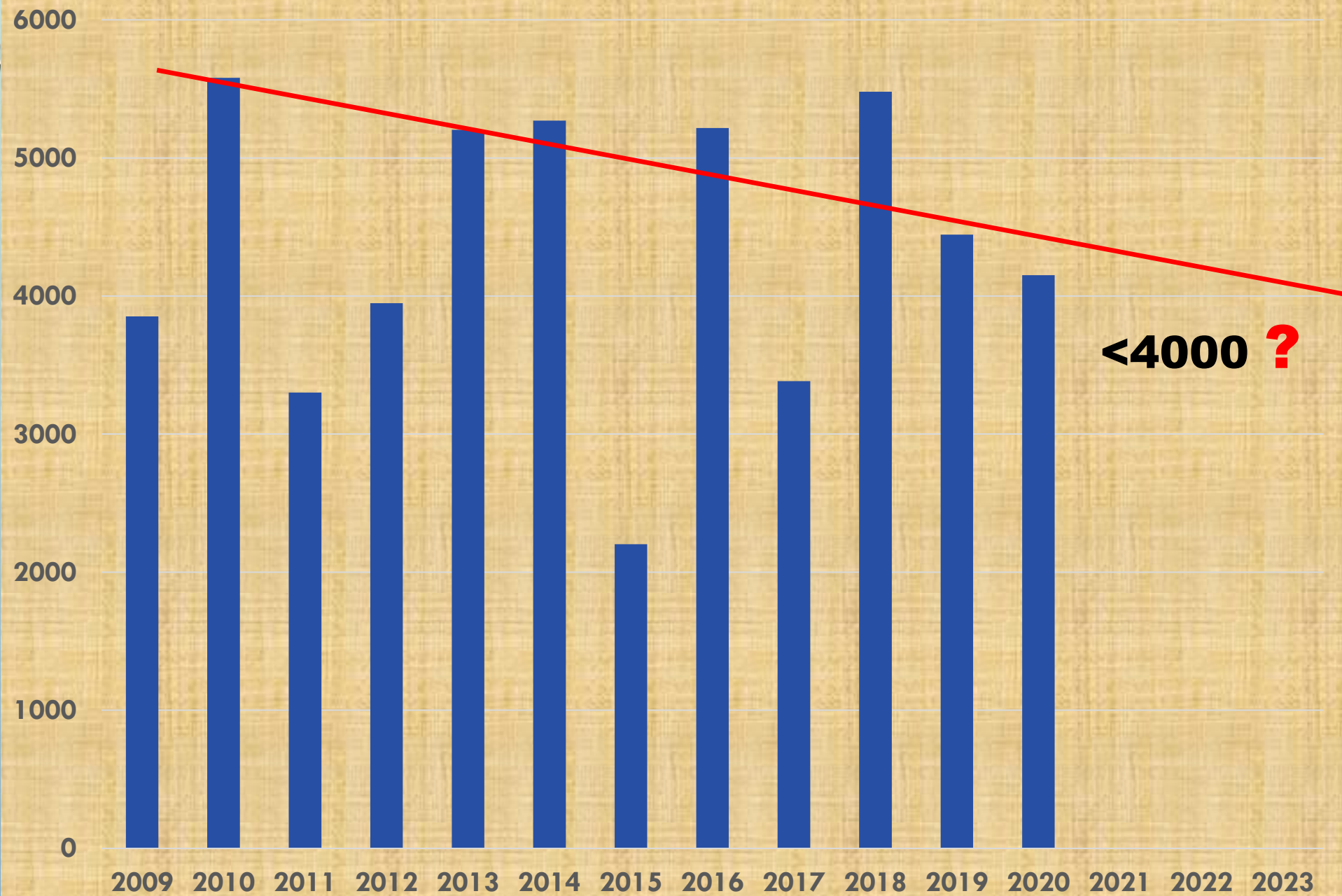
RAINWATER HARVESTING



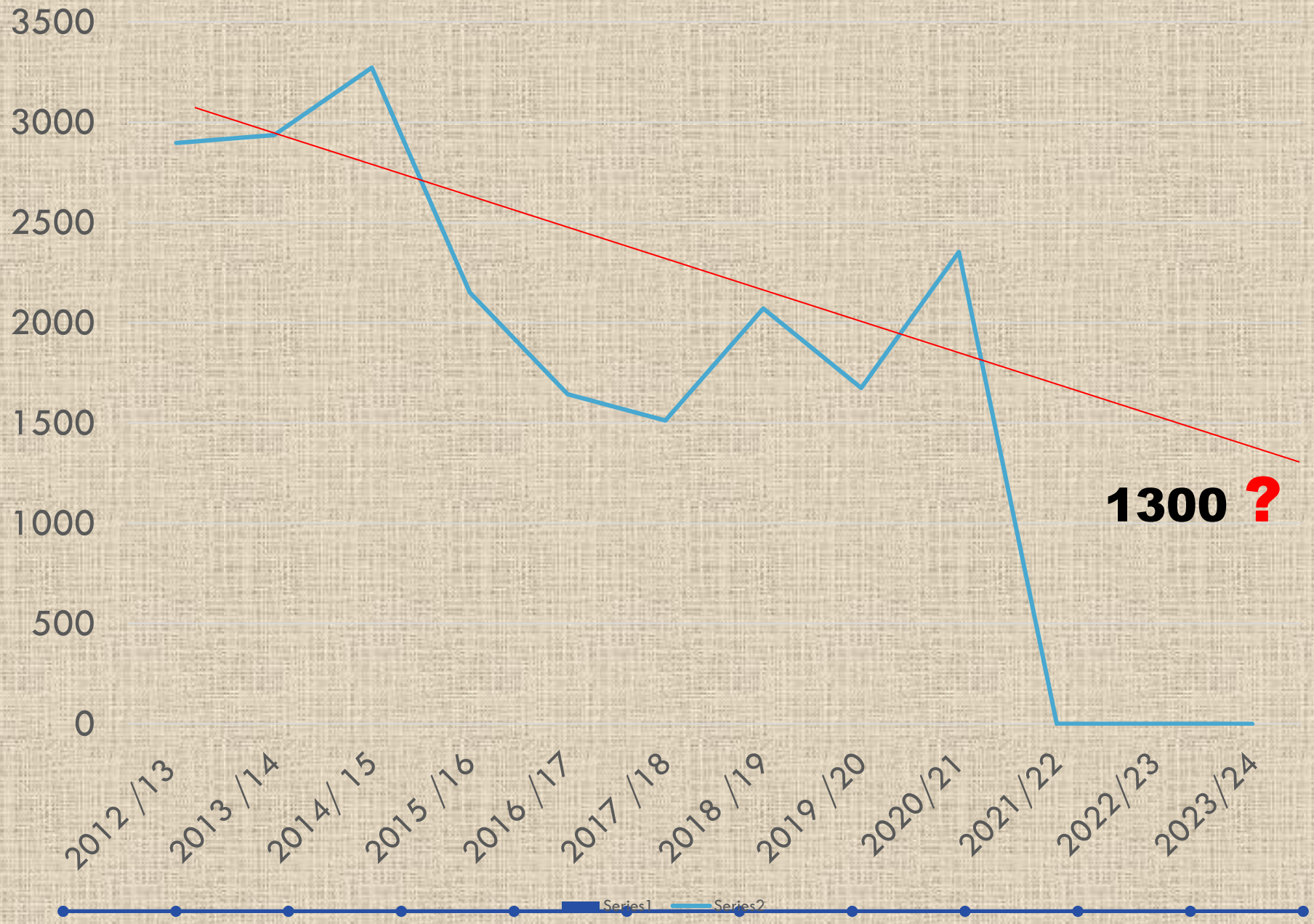
**THE PROCESS OF
ACCUMULATION AND
STORAGE OF RAIN
WATER FOR RE-USE
RATHER THAN
ALLOWING IT TO
RUNOFF.**



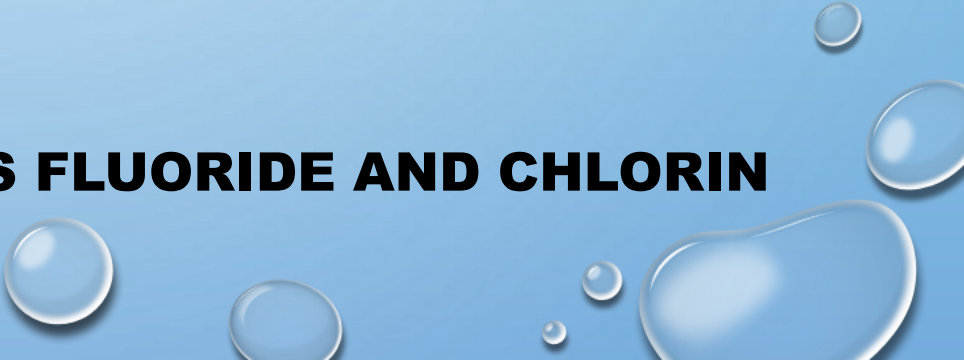
Up Country Rainfall Pattern



Rainfall Pattern - Mid Country



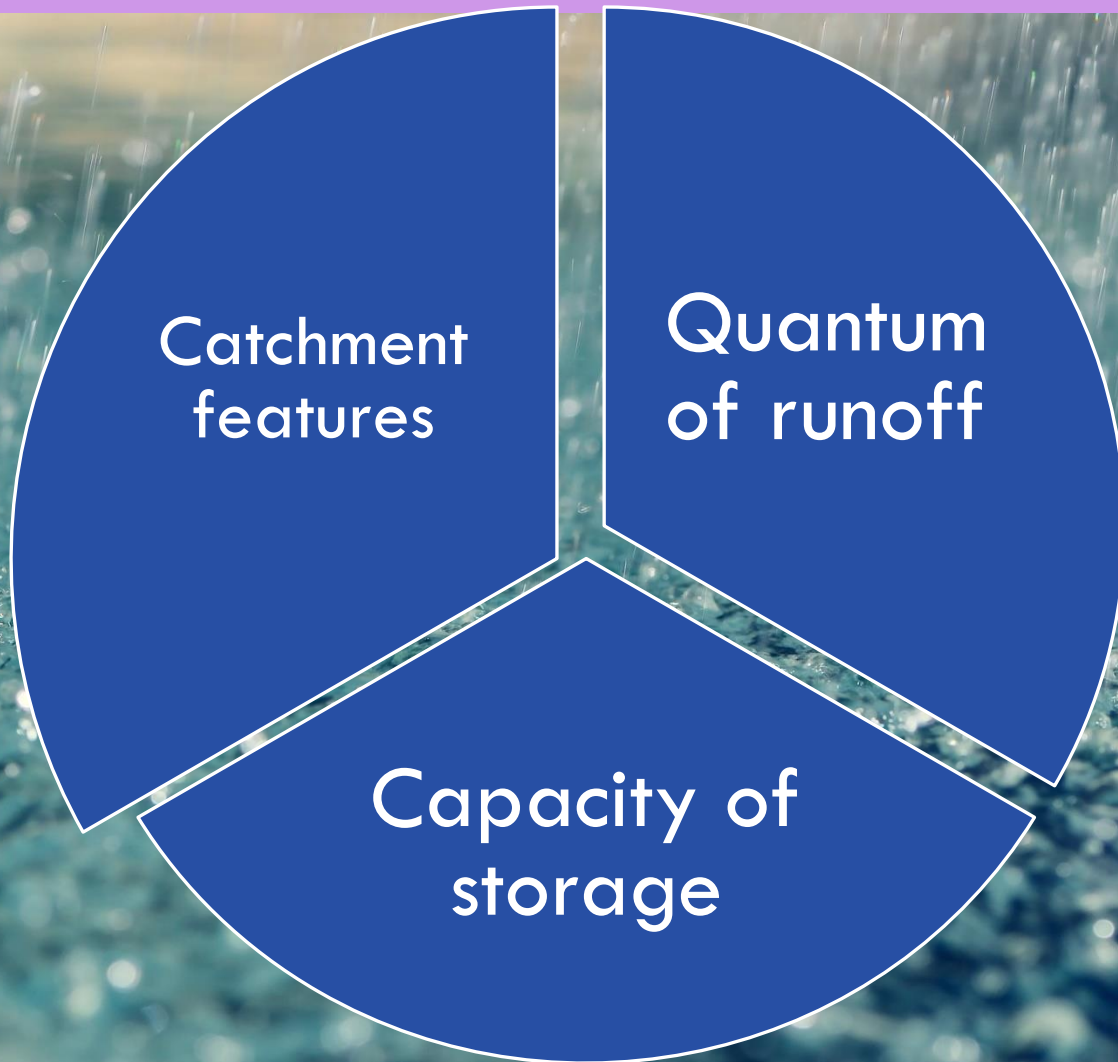
WHY RWHS?

- **FREE OF CHARGE**
 - **SOCIALLY ACCEPTABLE**
 - **ENVIRONMENTALLY FRIENDLY**
 - **PROMOTE SELF SUFFICIENCY**
 - **REDUCES THE NEED OF COMMERCIAL WATER**
 - **REDUCE PEAK DEMANDS**
 - **GREAT BACKUP WATER SUPPLY FOR EMERGENCY**
 - **REDUCE THE RUNOFF**
 - **REDUCE SOIL EROSION**
 - **FREE OF CHEMICALS SUCH AS FLUORIDE AND CHLORIN**
 - **CROP BOOST IN DRY SPELL**
- 

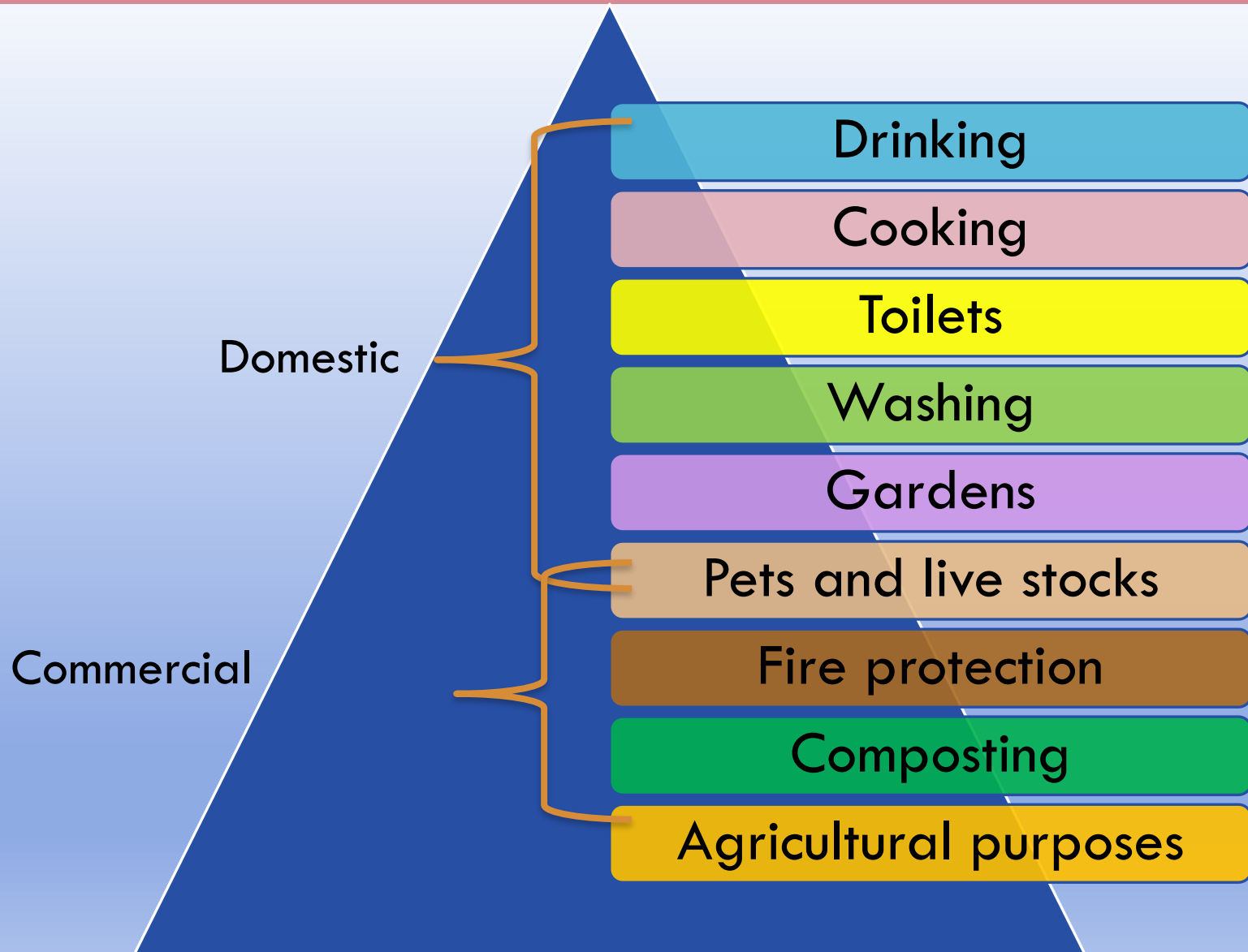
BENEFITS OF RWHS...

- REDUCE THE WATER BILL – REDUCE THE CONSUMPTION OF GROUND WATER
- REDUCE LONG TERM WATER DEVELOPMENT NEEDS
- LESS EXPENSIVE THAN TREATED WATER – COST EFFECTIVE – RELATIVELY SIMPLE TEC
- REDUCE THE WATER DEMAND – CONSERVE WATER
- CAN USE FOR IRRIGATION PURPOSE AND FOR AREAS WHERE WATER SOURCES ARE UNAVAILABLE
- PLANTS AND BUSHES COULD SURVIVE THROUGH DROUGHTS
- CAN BE AVAILABLE FOR DEFUSING WILDFIRES
- KEY TO FUTURE WATER CONSERVATIONS GAINS AND ENERGY CONSERVATION.
- CAN BE USED ON PUMP OR GRAVITY SYSTEM – SIMPLE METHOD AND EASY TO PRACTICE
- REDUCES SOIL EROSION AND PROLUSION OF WATER BODIES DUE TO FERTILIZER AND PESTICIDES AND FUDS.

FACTORS EFFECTING VOLUME OF RAIN WATER HARVESTED



USES OF RAIN WATER HARVESTING SYSTEM



Roof Tops

Dams

Under Ground Water Tanks

Water Collection Reservoirs

Trenches

Our Goals....

- 💧 65 ponds – 180 million liters
- 💧 Irrigate 25% of land extent with RW
- 💧 5% of land extent as water shed
- 💧 15% of land extent as catchment area
- 💧 Increase soil carbon level up to 4%
- 💧 Portable water to all estate households
- 💧 Educate estate community on preventing water

Our achievements against Our Goals.....

Target	Achieved (as at end Jan 21)
65 ponds (180 million liters of water)	77 ponds 254,107,870 L per harvest
Irrigate 25% of land extent with RW	Oil Palm 50Ha
5% of land extent as water shed	1.24% development
15% of land extent as catchment area	10.5%
Increase soil carbon level up to 4%	2.75%
Portable water to all estate households	64%
Educate estate community on preventing water pollution	75%

CAPACITY EVALUATION RAINWATER HARVESTING PONDS

Region

**Number of
Ponds**

**Volume per
harvest**

Our Goal..... 65 ponds – 180 million liters

Up Country

20

16,041,870 L

Mid Country

10

1,440,000 L

Low Country

47

227,076,000 L

Total

77

254,104,870 L

REQUIREMENT OF WATER

Region	No. of Trees	Water Requirement per day (L)	Total Volume Required (L)
Low Country – Oil Palm	149,794	150	22,469,100
Tea – UC / MC / LC	18,489,000	1	18,489,000
Total			40,958,100

PROJECT AT DEVITURAI ESTATE



- **TOTAL COST 18 MN**
- **EXTENT 50 HA**
 - **MATURE 24 HA**
 - **IMMATURE 26 HA**
- **TOTAL – 6000 TREES**
- **WATER DISCHARGE – MATURE 120 L IN TWO HOURS PER DAY PER TREE**
- **IMMATURE 80 L IN TWO HOURS PER DAY**
- **ROI – 5 YEARS**
- **EXPECTED YIELD INCREASE – 25 TO 50%**

STEPS - COMMENCEMENT



WORK IN PROGRESS...SEPTEMBER 2020





POND NO 1

Size	50' X 42'
Capacity	475,000Lit
Extent Covered	10.50Ha
Field no	14 OP
Year of Planted	2005
No Of drippers per palm	15
Out Put	60 Lit/hr

POND NO 2

Size	50' X 30'
Capacity	512,000Lit
Extent Covered	13.6Ha
Field no	mature 20 OP (3.00Ha)
YOP	2015
Immature	16.94 OPNC
YOP	2017
No Of drippers per palm	15
Out Put	60 Lit/hr



RAIN WATER HARVESTING PITS IN SHEEN ESTATE



10.10.2020

RAIN WATER HARVESTING FROM FACTORY ROOF MEDDECOMBRA FACTORY – 27000 L



LIMITATIONS OF RAINWATER HARVESTING

- **UNPREDICTABLE RAINFALL – LIMITED OR NO RAINFALL**
 - **UNAVAILABILITY OF PROPER STORAGE SYSTEM / STORAGE LIMITATIONS**
 - **LEACHING OUT**
 - **REGULAR MAINTENANCE**
 - **REQUIRES TECHNICAL SKILLS**
 - **ATTRACT MOSQUITOES AND WATERBORNE DISEASES**
 - **HIGH COST**
 - **ROOF MAY SEEP CHEMICALS AND ANIMAL DROPPINGS**
- (DOMESTIC USAGE)**

Living in the soil are plant roots, bacteria, fungi, protozoa, algae, mites, nematodes, worms, ants, maggots, insects and grubs, and larger animals.

science of soil

soil is
made of about **45%** minerals
25% water
5% organic matter **25%** air



what's underneath



Healthy soil has amazing water-retention capacity.

Every **1%** increase in organic matter results in as much as **25,000** gal of available soil water per acre.



One teaspoon of healthy soil contains
100 million-1 billion individual bacteria



All of the soil microbes in **1 ac/ft** of soil weigh more than **2 cows**

Earthworm populations consume **2 tons** of dry matter per acre per year, partly digesting and mixing it with soil



what it does



Healthy soil is key to feeding

9 billion    by **2050**

$$3759.7\text{Ha} \times 25000 = 93,992,500 \text{ Gal}$$

Advantages by retention of water through improvement of soil organic matter



Composting Progress - 2020/2021 as at end February 2021			
Estate	Compost Estimated (Kg)	Compost actual (Kg)	%
Meddecombra	255333	220470	86
Sheen	341000	193189	57
Fernlands	565982	62877	11
Dunsinane	653146	476400	73
New Peacock	350188	437771	125
Nayapana	328502	142259	43
Lelwala	168283	142926	85
Gulugahakanda	345483	87900	25
Thalgaswella	1933791	1660585	86
Devitura	960086	430870	45
Ketandola	909790	554160	61
Elpitiya	1073320	595250	55
Bentota	245966	504230	205
	8130870	5508887	68

IMPROVEMENT OF SOIL ORGANIC CARBON LEVELS

Financial year	Below 2% O.C (ha)	% on total extent	2 – 3 % O.C (ha)	% on total extent	3 % & above O.C (ha)	% on total extent
2017/ 2018	1720.13	47.23%	1657.81	45.53%	263.50	07.23%
2018/2019	1154.87	31.84%	2006.88	55.34%	464.23	12.80%
2019/2020	891.04	24.92%	2166.05	60.59%	517.36	14.47%

Restoration of Stream reservations



Soil Conservation methods



First



Second



Third



Fourth



THANK YOU

