

IMPACT ASSESSMENT OF CHECK DAMMING ON SOIL PHYSICAL PROPERTIES & FLORAL BIODIVERSITY IN TEHSIL TALAGANG, DISTRICT CHAKWAL, PAKISTAN

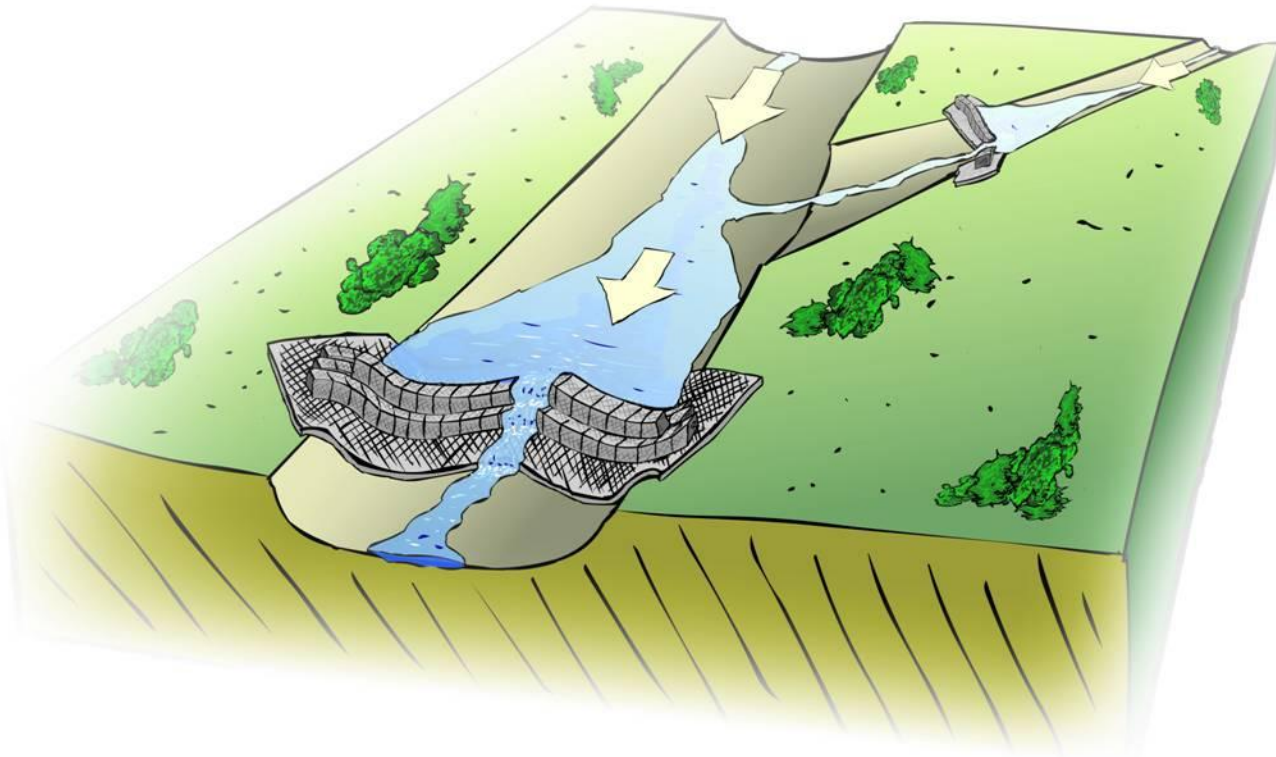
By

❖ **Tariq Mehmood Bangash**
Watershed Management Specialist
Pakistan Forest Institute
Peshawar

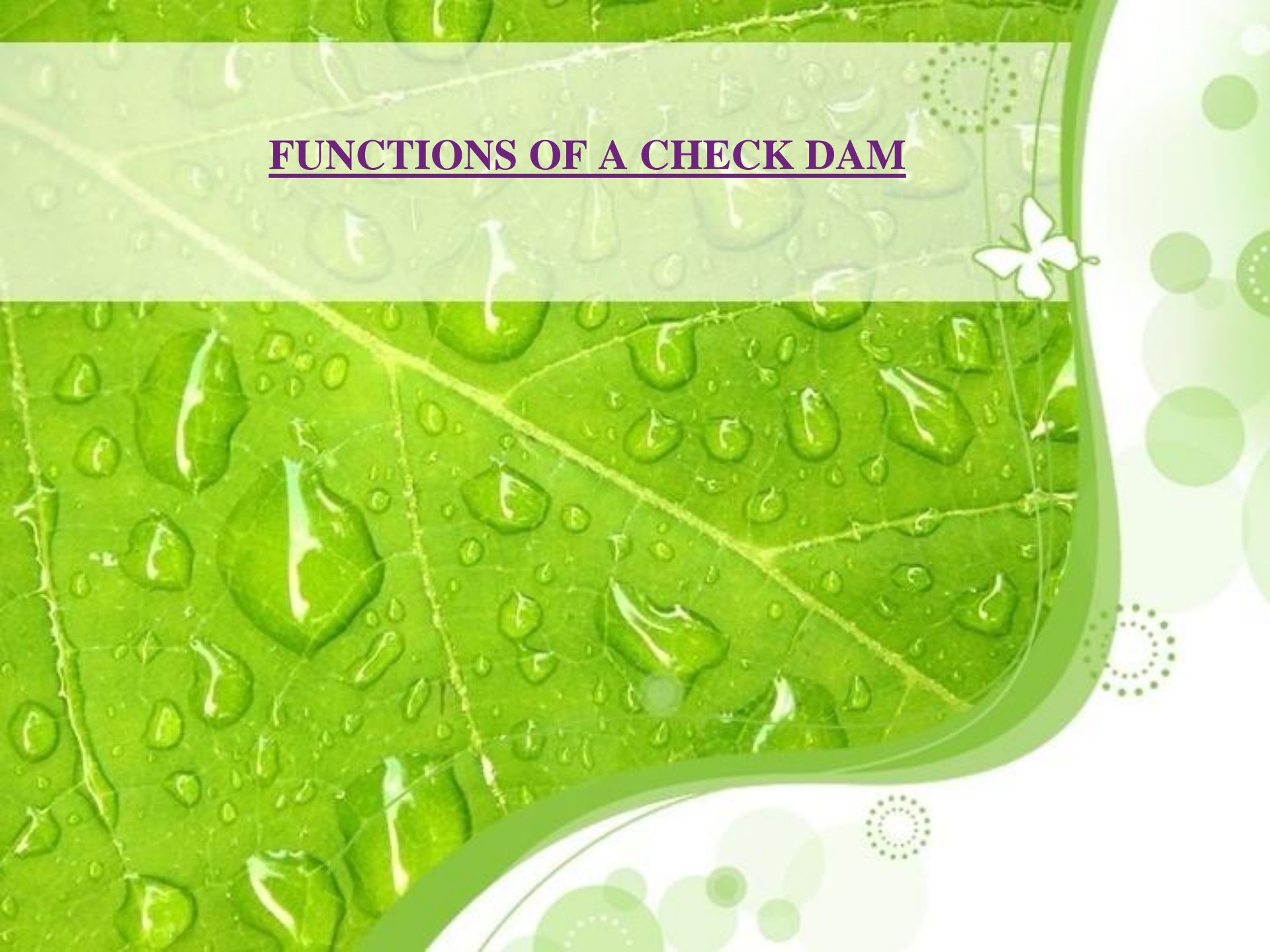
❖ **Taymoor Arif**
Project Coordinator
IUCN Pakistan

CHECK DAM

A check dam is a small dam, which can be either temporary or permanent, built across a minor channel or drainage ditch and are usually built with logs, stone, or sandbags.



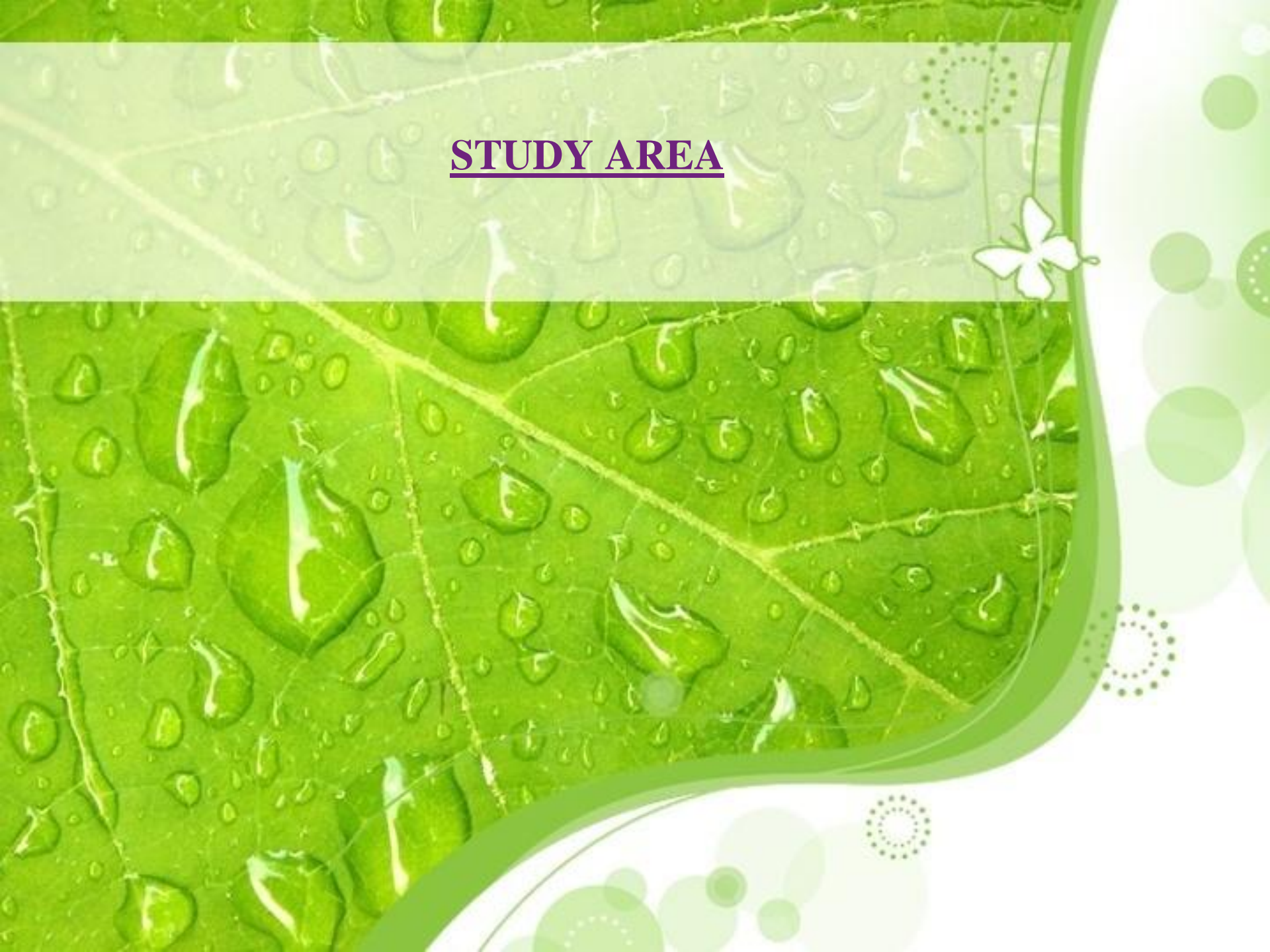
FUNCTIONS OF A CHECK DAM





- **Obstacle**
 - **Velocity & Silt-Carrying Capacity**
 - **Cease Deepening of Channel**
- **Increased Percolation & Ground Water Storage**
 - **Soil Moisture**
 - **Supports Flora**

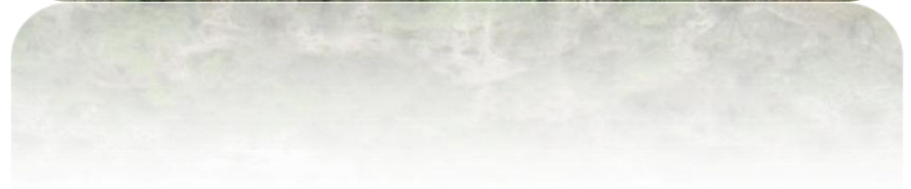
STUDY AREA



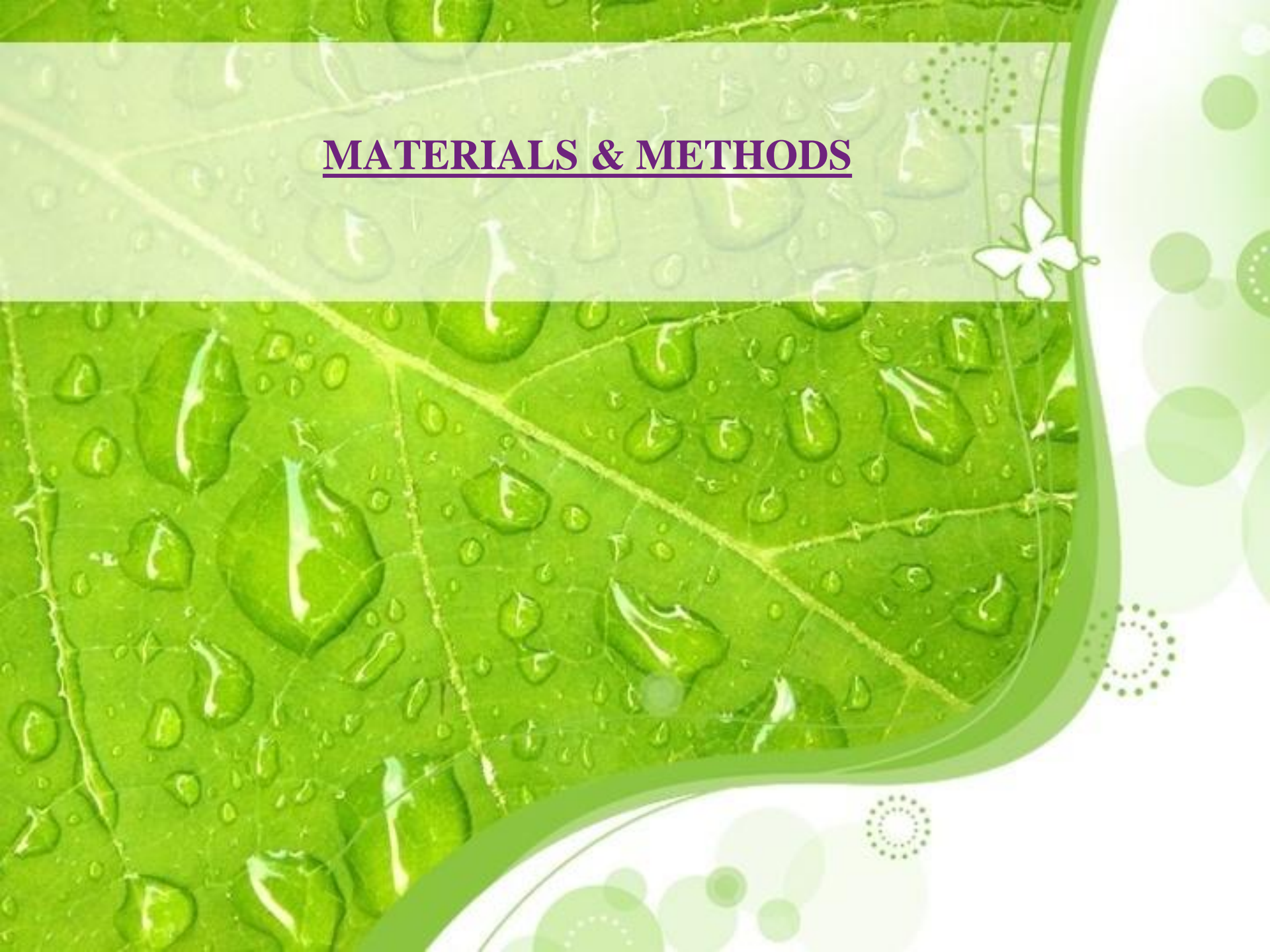


Features

- Extreme Weather & Xerophytic Conditions
- Dry Deciduous Scrub Vegetation
- Poor Soil
- Vegetation:
 - Acacia modesta*
 - Dodonea viscosa*
 - Olea cuspidata*
- Wildlife:
 - Black partridge, Grey partridge,
 - Nightingale, Quail, Jackal, Fox,
 - Snakes.



MATERIALS & METHODS





- Two Sites

T₁ (Treated)

T₂ (Control)

- Transect Lines

- Infiltration Capacity
- Soil Moisture
- Soil Porosity
- Soil Texture
- Soil pH
- Soil Electrical Conductivity
- Vegetation Survey

- Statistical Analysis (ANOVA, at 5%)

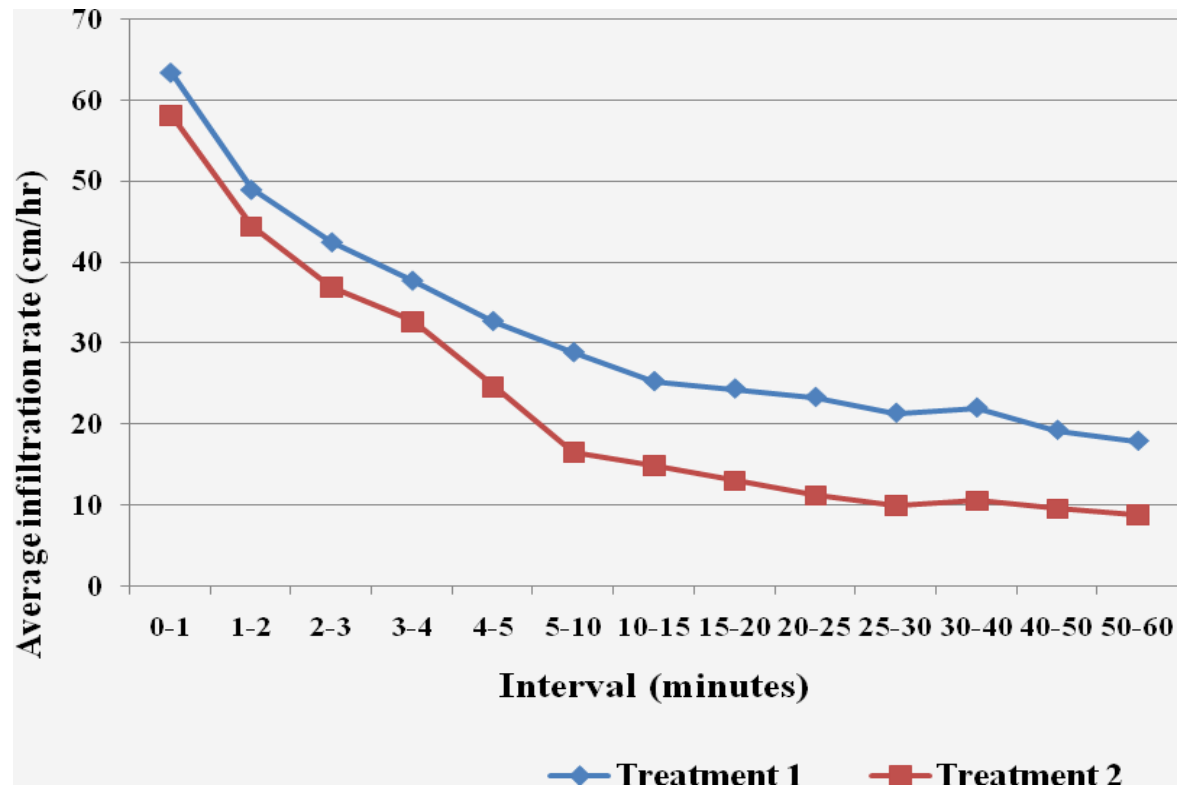


RESULTS



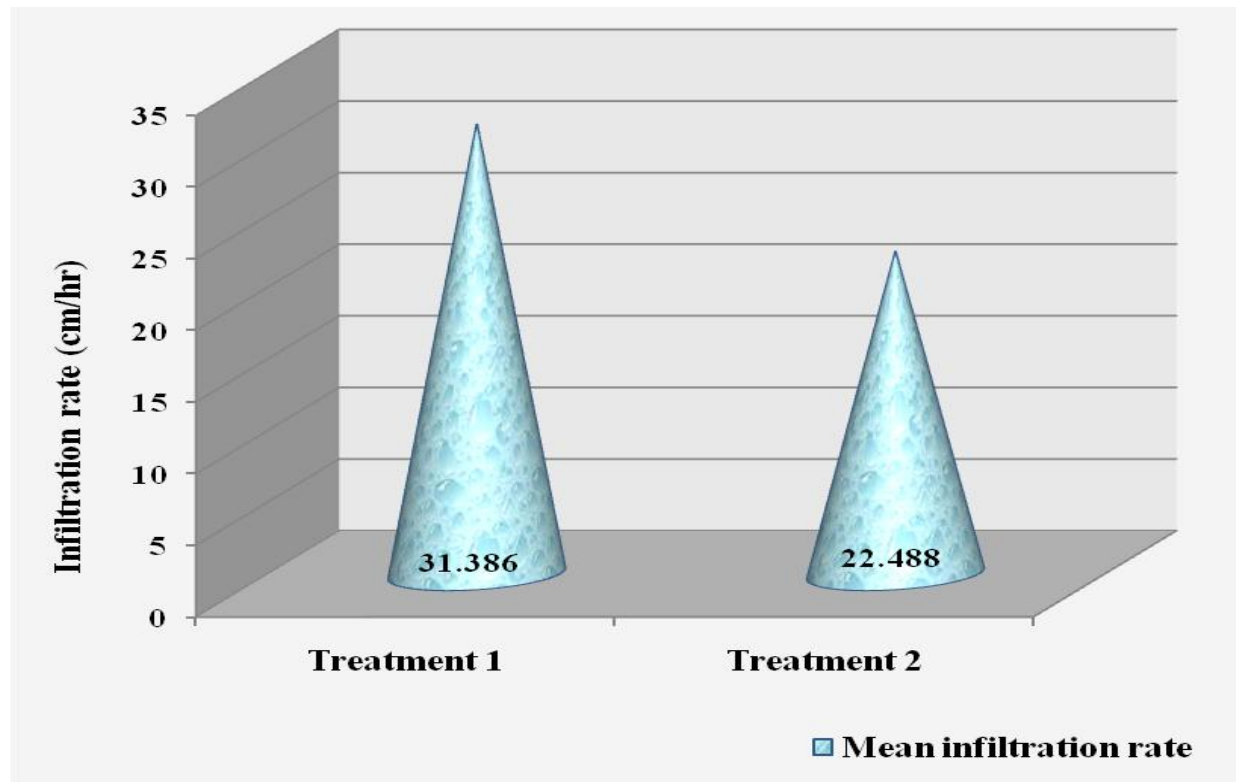
Infiltration Rates

Comparison of average infiltration rates at T_1 & T_2



Comparison of Mean Infiltration Rates

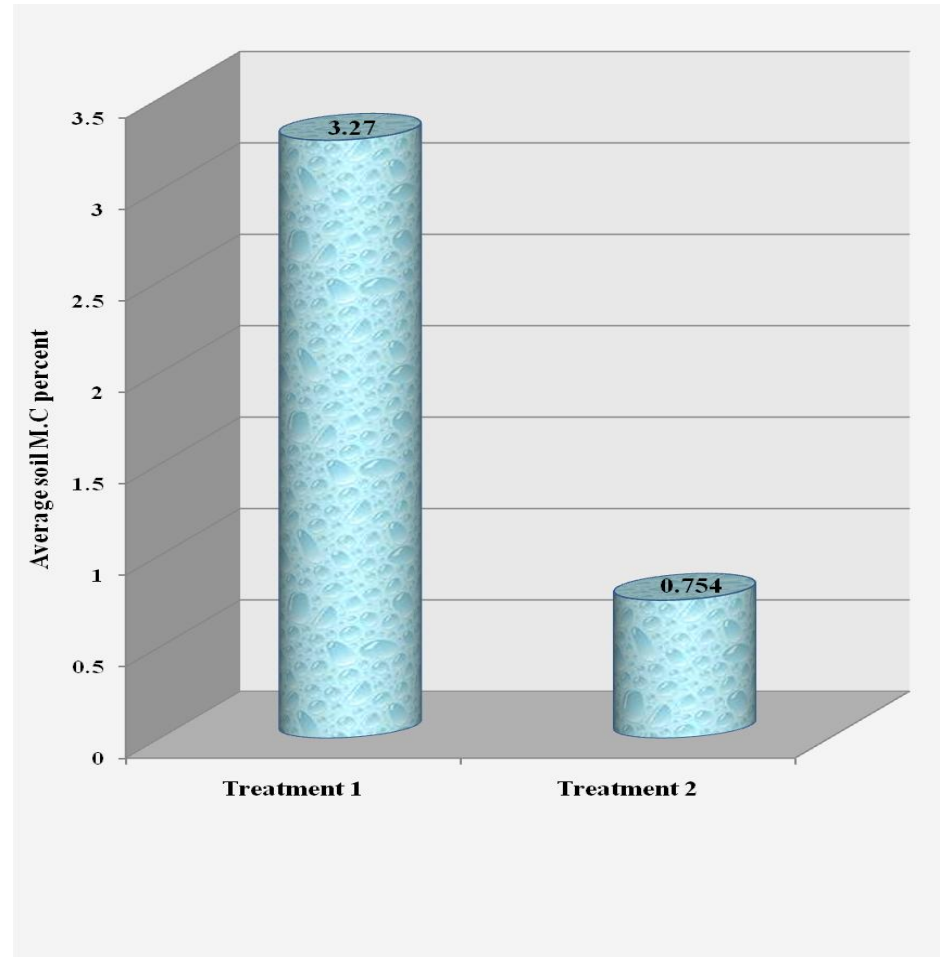
T_1	T_2
31.38 cm/hr	22.48 cm/hr



Soil Moisture

- Comparison of soil moisture content percent

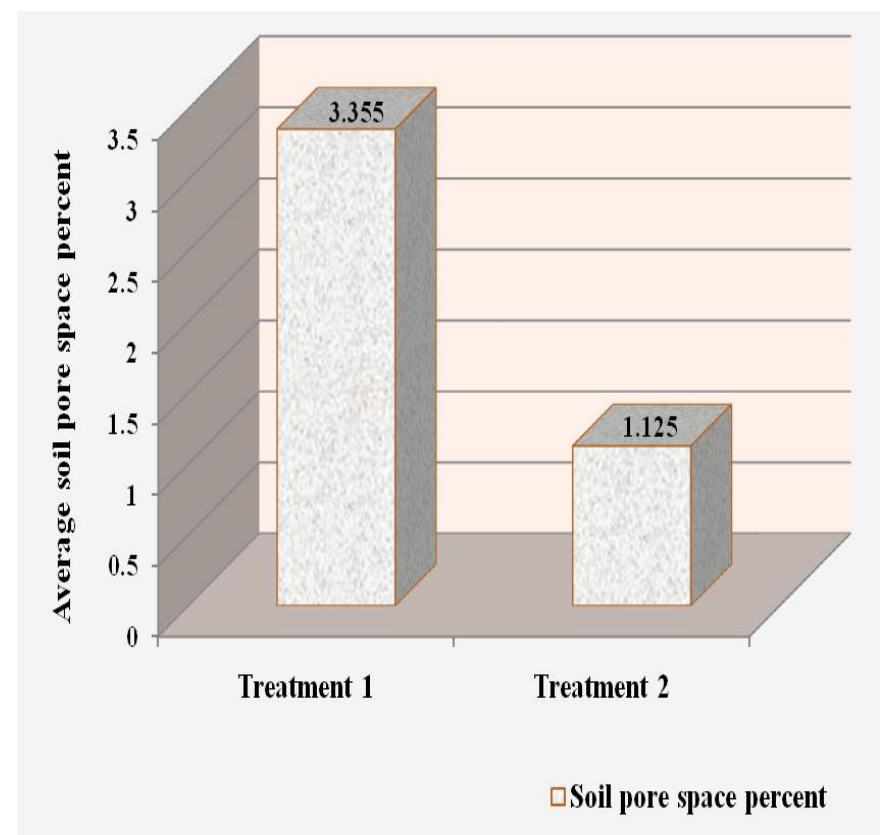
Average Soil M.C%	
T ₁	T ₂
3.27	0.754



Soil Porosity

- **Comparison of soil pore space percent:**

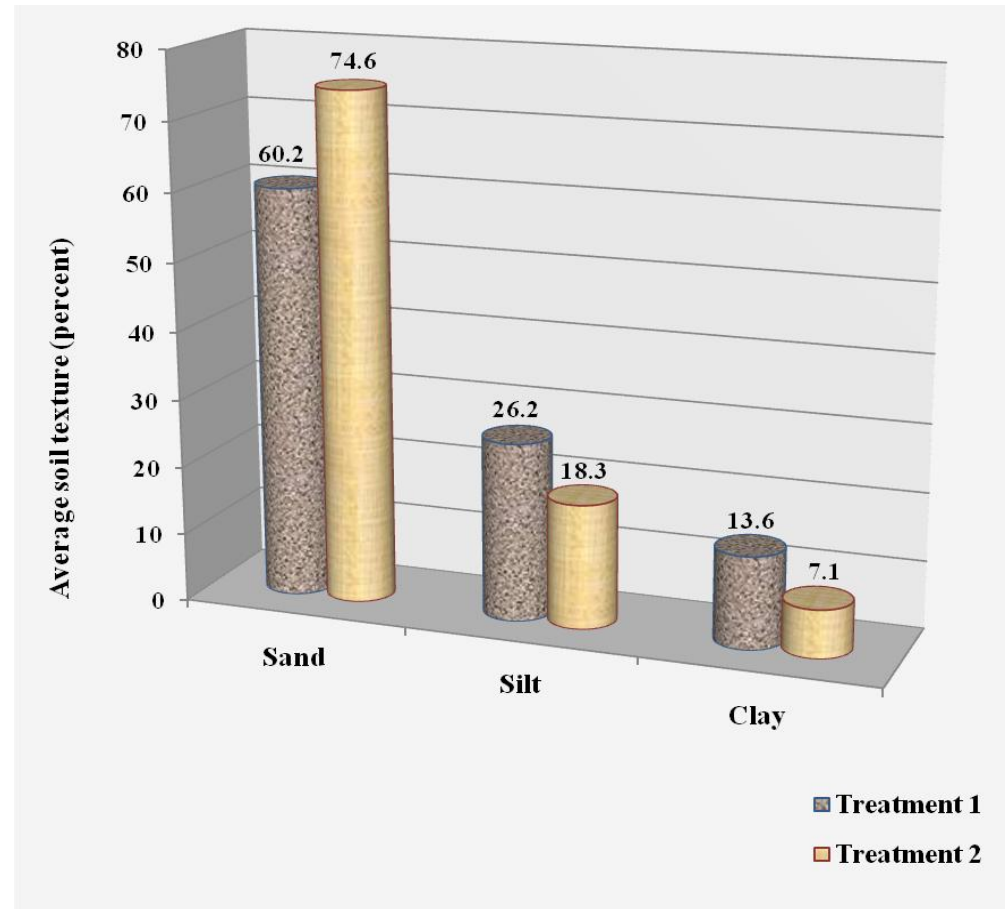
Average soil pore space percent	
T ₁	T ₂
3.355	1.125



Soil Texture

- **Comparison of soil texture**

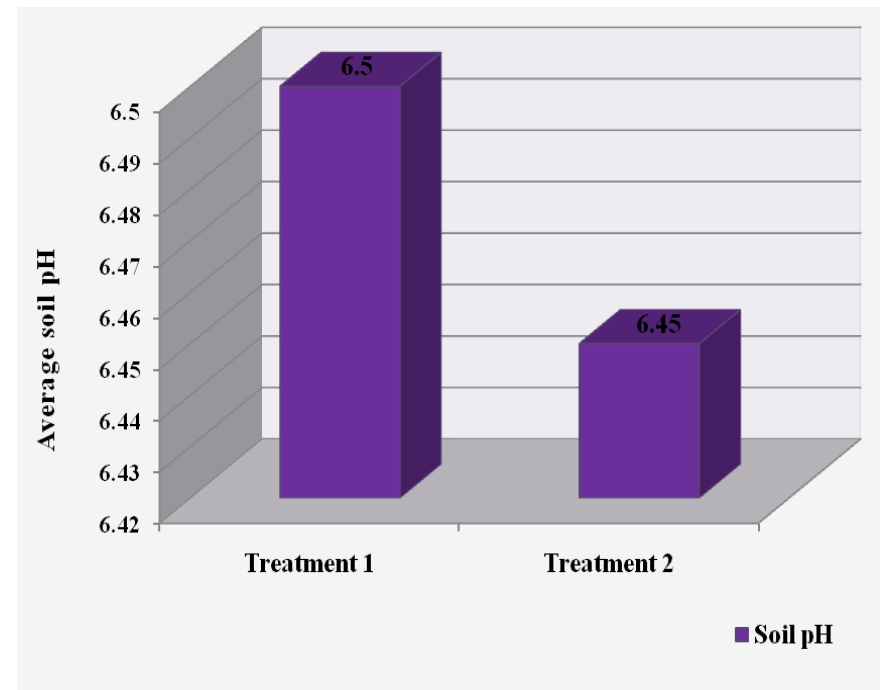
Average	T ₁	T ₂
Sand	60.2%	74.6%
Silt	26.2%	18.3%
Clay	13.6%	7.1%
Texture Class	Sandy Clay Loam	Sandy Loam



Soil pH

- Comparison of average soil pH

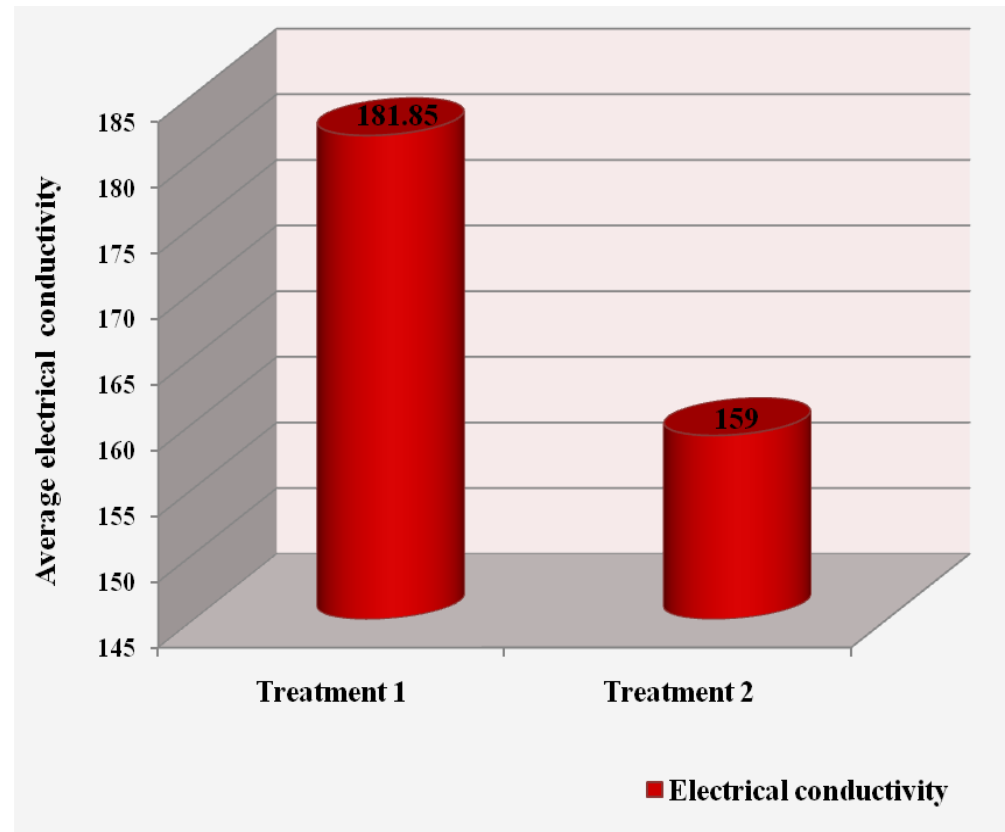
T ₁	T ₂
6.5	6.45



Soil Electrical Conductivity

- Comparison of average $E.C_e$ ($\mu\text{Siemens/cm}$)

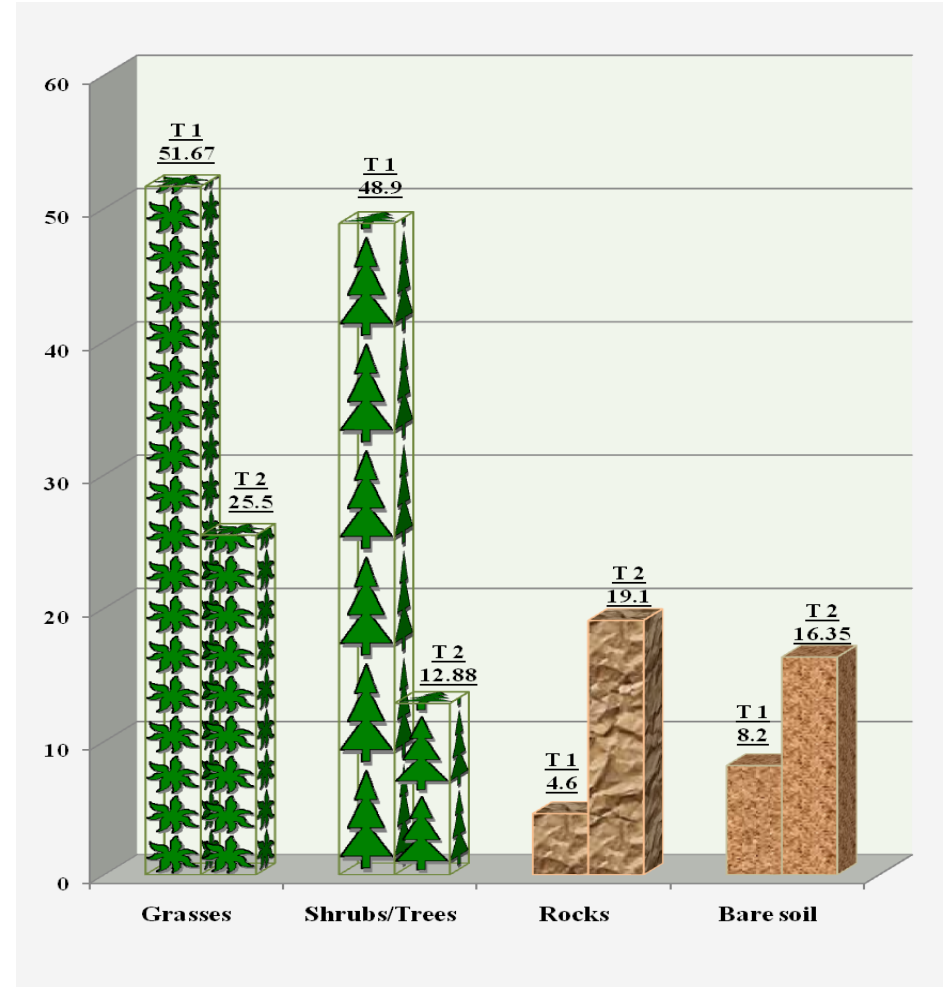
T_1	T_2
181.85	159



Vegetation Cover Percent

- Comparison of average vegetation cover percent

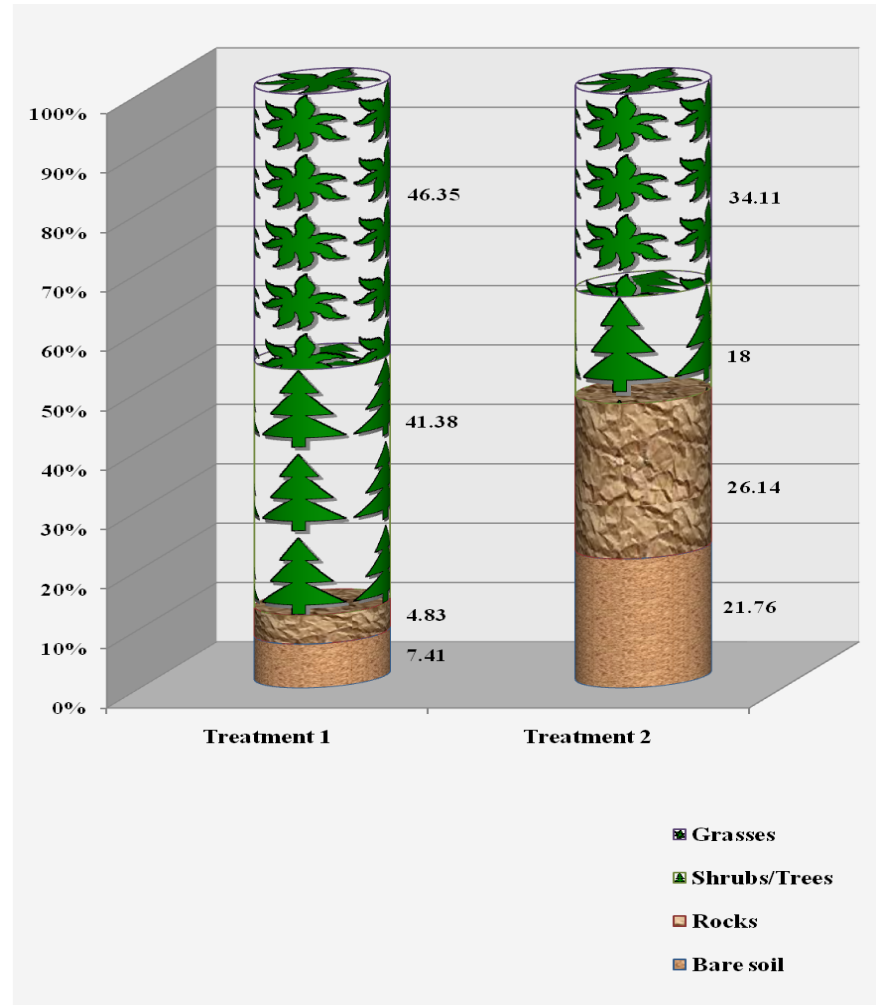
Species	T ₁	T ₂
Grasses	51.67	25.5
Shrubs/Trees	48.9	12.88
G. Total	100.6	38.42



Species Composition Percentage

- Comparison of average species composition percentage

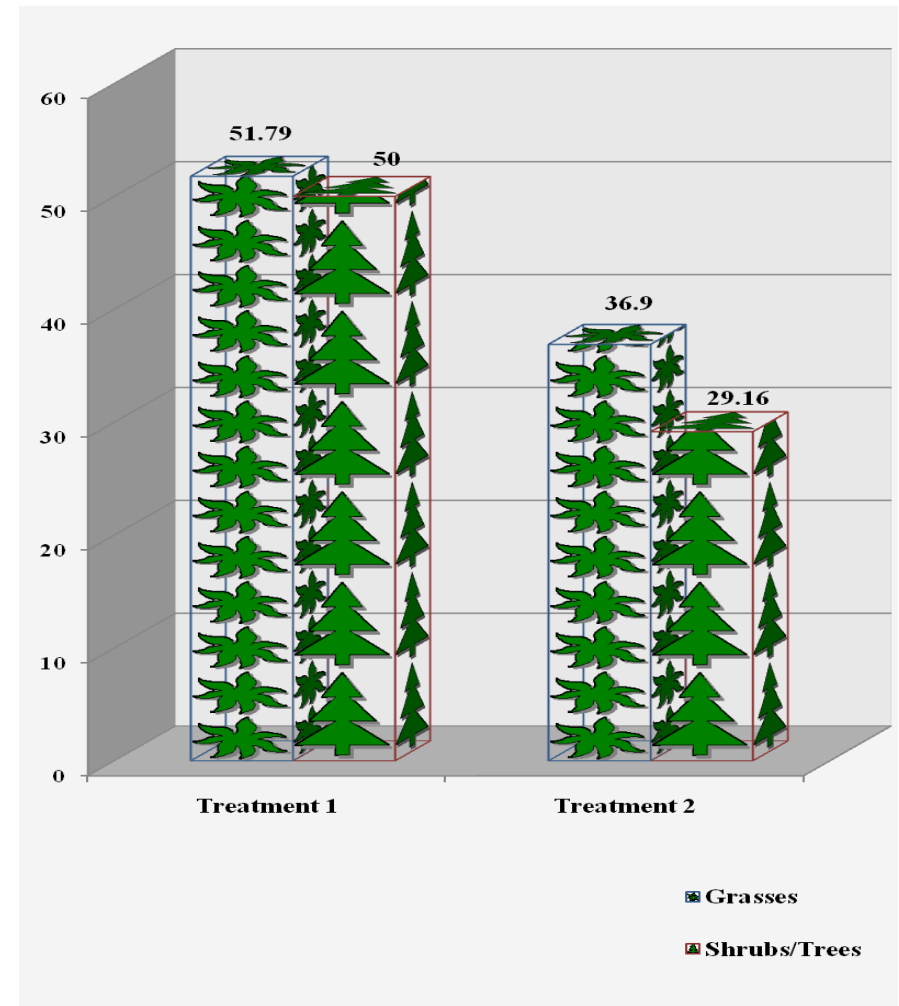
Species	T ₁	T ₂
Grasses	46.35	34.11
Shrubs/Trees	41.38	18
G. Total	87.73	52.1



Species Frequency Percentage

- Comparison of mean species frequency percentage

Species	T ₁	T ₂
Grasses	51.79	36.9
Shrubs/Trees	50	29.16



ABSTRACT



Soil Physical Properties

Property	T ₁	T ₂	Impact of Check Dam Treatment
Infiltration capacity	31.38 cm/hr	22.488 cm/hr	Increase by 39.5%
Soil moisture content	3.27%	0.754%	Increase by 333.7%
Soil porosity	3.355%	1.125%	Increase by 198.2%
Soil texture class	Sandy Clay Loam	Sandy Loam	Trend towards sandy to sandy clay loam
Soil pH	6.5	6.45	Trend towards neutrality
Soil E.C _e (μSiemens/cm)	181.85	159	Increase by 14.3%

Floral Biodiversity Dynamics

Floral bio-diversity dynamics		T ₁	T ₂	Impact
Vegetation cover percent		100.6	38.42	Improvement of 161.8%
Species composition	Grasses	46.35	34.11	Improvement of 35.88%
	Shrubs/trees	41.38	18	Improvement of 130%
Species frequency percentage	Grasses	51.79	36.9	Improvement of 40.35%
	Shrubs/trees	50	29.16	Improvement of 71.5%



THANK YOU

**Think of Palestine, Persia, Mesopotamia &
show me a nation that has been able to
rehabilitate after devastated by war,
if only the country in which it lived
was well watered & productive but,
where is the nation devastated by the desert,
that has been able, or ever will be able to
rehabilitate itself?**

**instead of talking of national protection
by means of Army & Navy, we should
talk of national protection by means of
Forest, Agriculture,
Army & Navy.**