

# Why keep your soil?



**It's the basis of your business**

# Some soils erosion types

**Increasing level of soil lost per area**  
→



**Raindrop splash**



**Sheet**



**Rill**



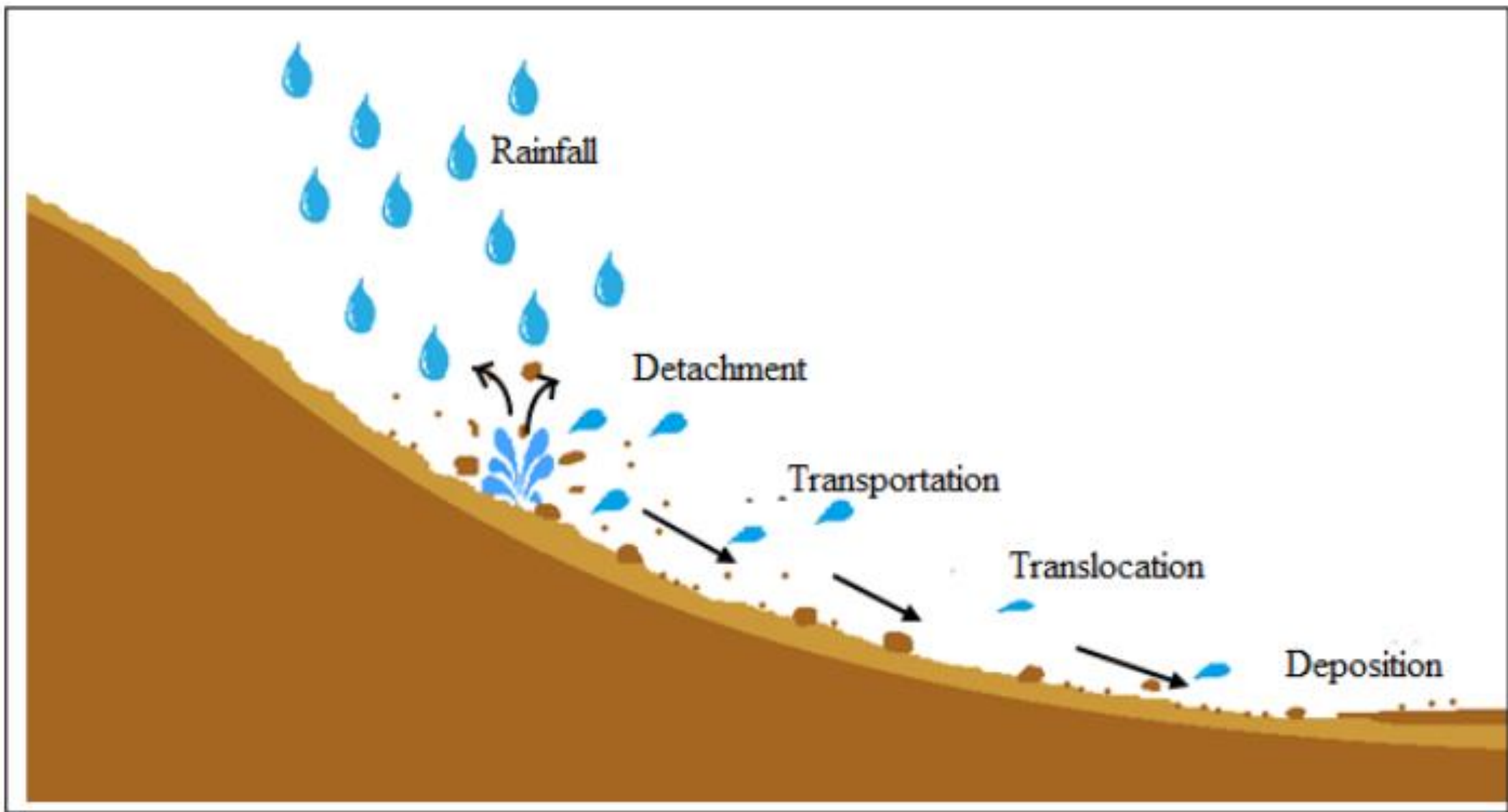
**Gully**



**Stream bank**

# Why do soils erode?





**Raindrops destroy soil aggregates and transport soil small distances. Flowing water detaches soil particles and transports them down hill. The size and amount of the particles transported increases with the kinetic energy of the water. The deeper the water is, the larger the particles moved. Soil strength and cover counteracts these forces.**

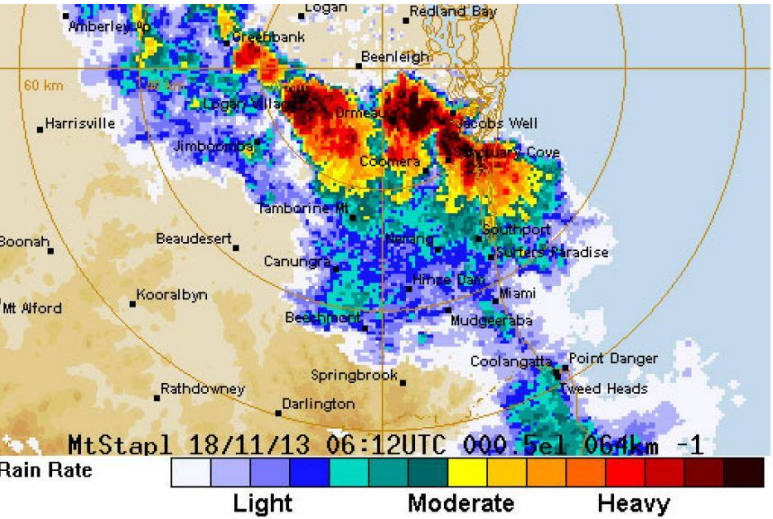
**How can we slow this process?**

**Need to understand what's happening so we can do something about it.**



# Factors influencing erosion rate

## Rainfall



## Soil type



## Topography



## Cover



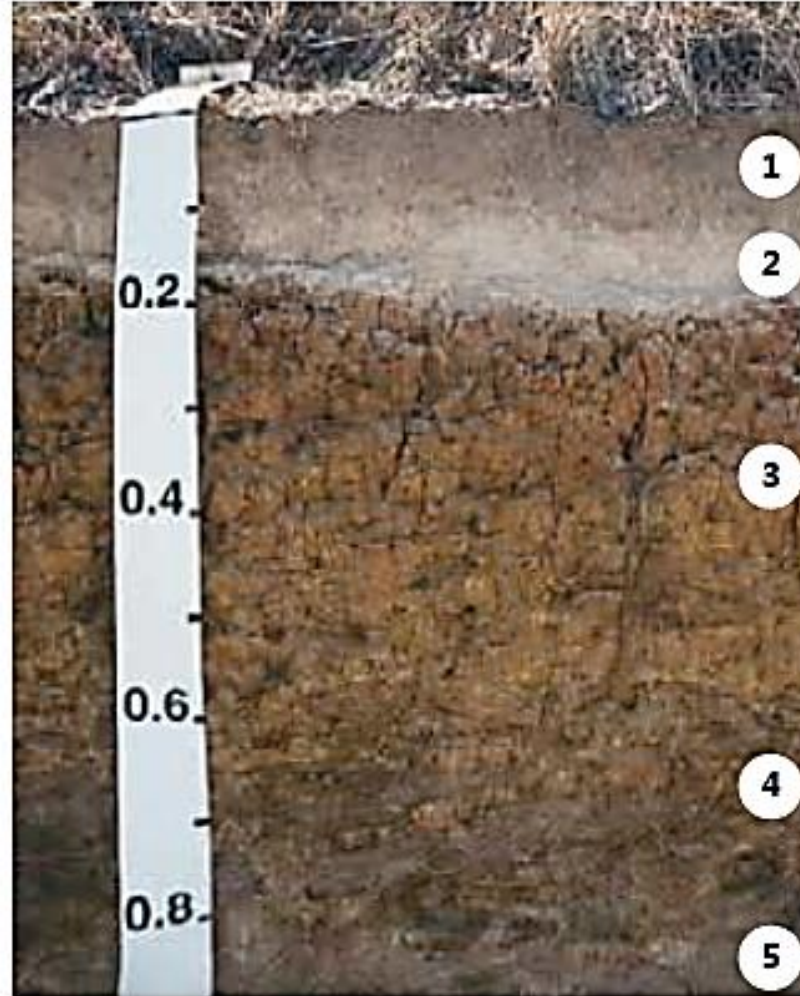
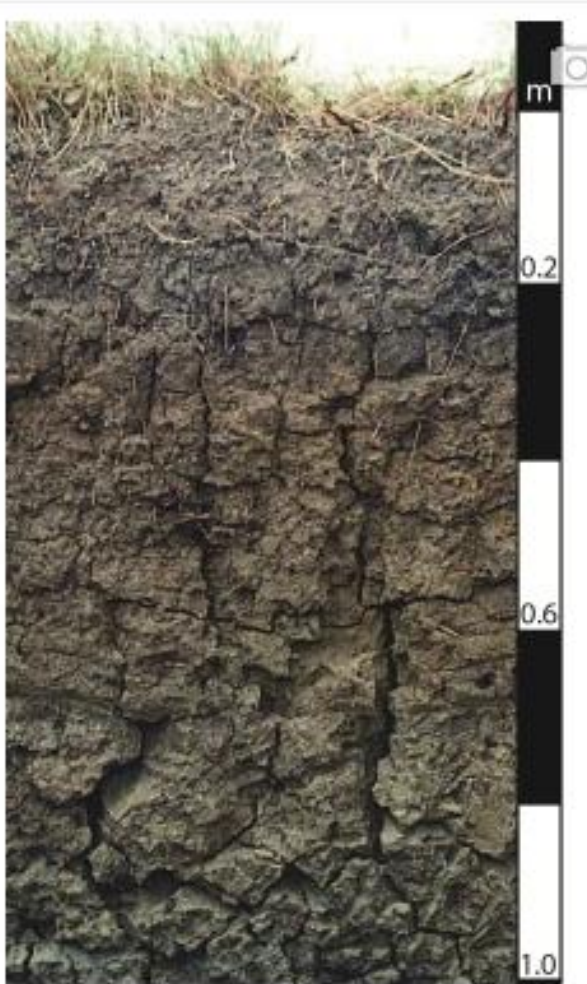
## Land management practices



R - Rainfall erosivity – intensity, duration but cannot do much about this – in Gods hands!



# Soil erodibility – need to know your soil(s)



## 1. Surface soil

Accumulation of organic matter causes darker colour

## 2. Subsurface soil

Less organic matter, paler colour and may have less clay than surface soil. Note: Pale subsurface horizons are not present in all soils.

## 3. Subsoil

Usually finer in texture (higher clay content) and stronger in colour (higher content of iron and other minerals) than horizons above.

## 4. Weathered parent material

Little affected by soil forming processes.

## 5. Generally overlying unweathered bedrock



**Soil erodibility affected by:**

**Infiltration/hydraulic conductivity, water holding capacity i.e. how much water can it take in and hold, (affected by structure, mulch, cracks, initial moisture content).**

**Crusting, plough pans bad.**

**Silty/sandy soils often more erodible but not always.**

**Aggregate size distribution – larger the better.**

**How aggregates behave when wet up? Dispersibility bad.**

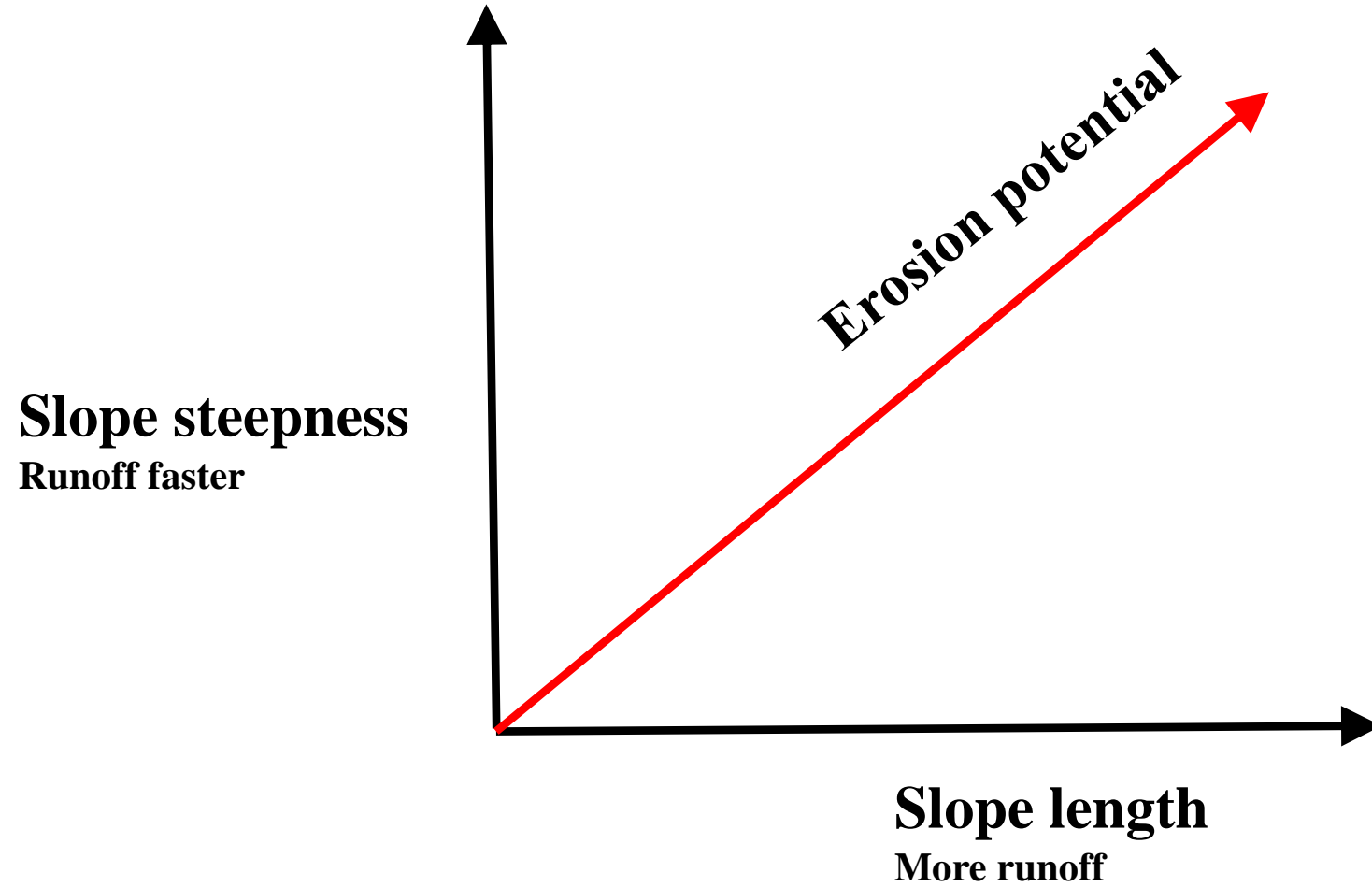


**Dispersion is a dirty word!**



**Photograph 47. Severe gully erosion on Ulogie soil due to the highly dispersive subsoil**

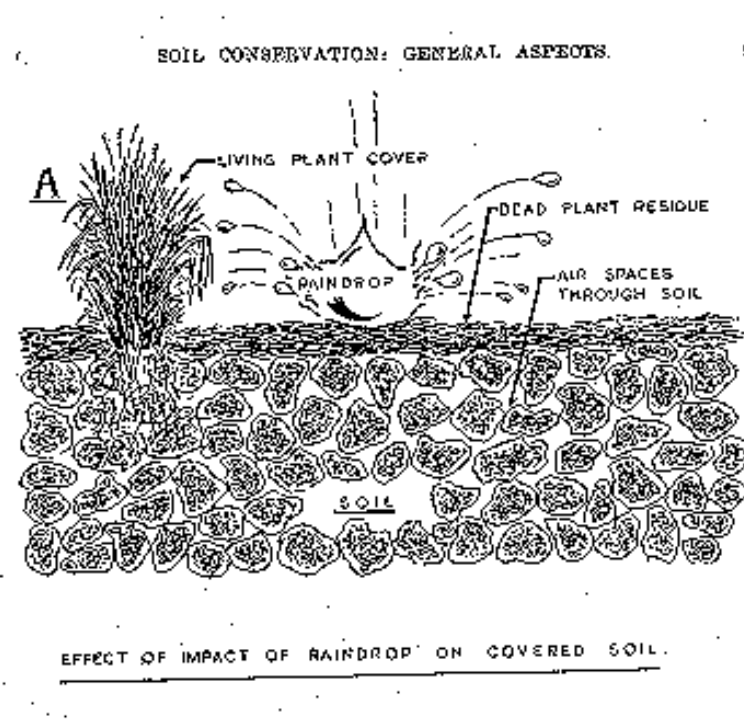
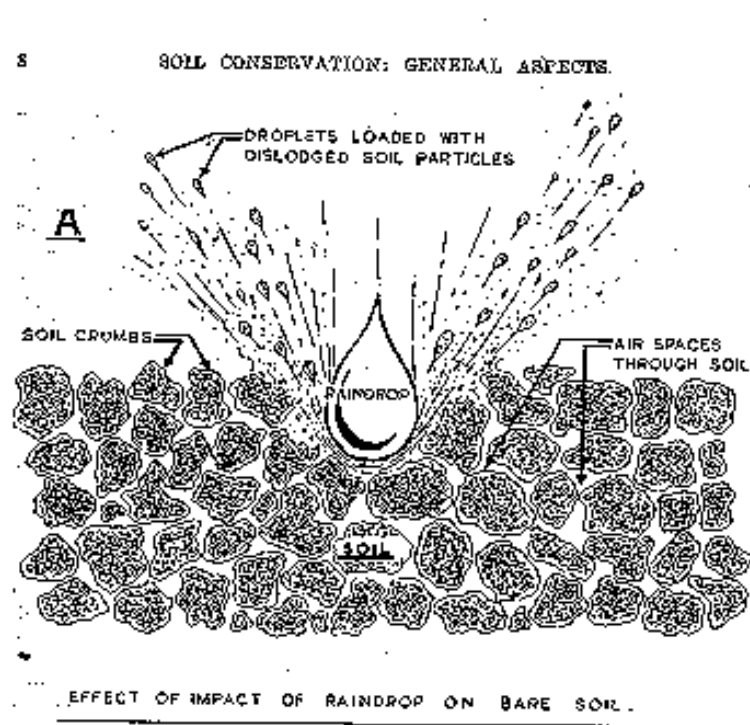
# Length (L) and Slope (S) factors



**Why? More runoff running faster**

## C – Cover / management factor – vegetation, rock

- adsorbs kinetic energy of rain drop
- slows runoff
- keeps soil surface porous
- maintains soil fertility



# P - support practice

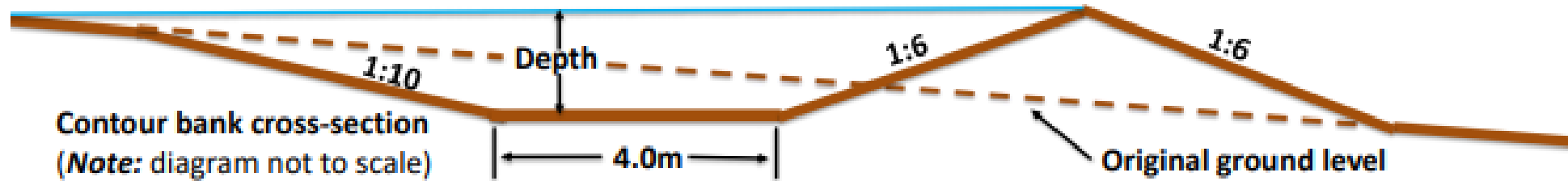


**Contour banks** - gradient for bare, cultivated soil 0.1-0.15% i.e. 100 - 150mm in 100m.

Can vary depending on soil type and crop management – e.g. for zero till, can go slightly steeper but will flow deeper.

Banks 0.6m deep, flat bottom, broad base if cracking soil, if more than 2,500m long be careful.

**Waterways** - natural drainage lines better than perched, well grassed (creeping types).



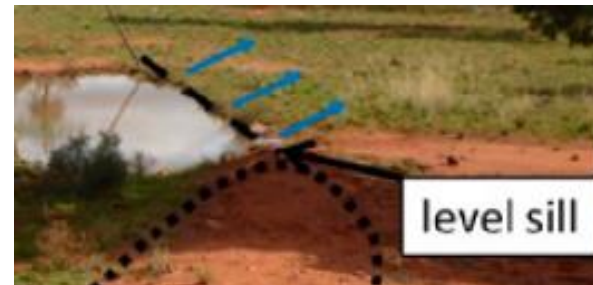
| Recommended contour bank (double) spacings, Central Highlands |                       |                         |
|---|-----------------------|-------------------------|
| Average land slope %  | Vertical interval (m) | Horizontal interval (m) |
| 0.5   | 0.75                  | 150                     |
| 1   | 1.2                   | 120                     |
| 1.5   | 1.5                   | 100                     |
| 2   | 1.8                   | 90                      |
| 2.5   | 2.0                   | 80                      |
| 3   | 2.1                   | 70                      |
| 4   | 2.4                   | 60                      |

**So to minimise soil erosion:**

**Reduce runoff amount (maximise infiltration and water holding capacity, detention)**



**Control any runoff (slow the flow – spread it)**





**Over to John**