

# Western Landcare Forum

## Healthy Landscapes - Healthy Food



**Major General the Honourable Michael Jeffery**  
**The National Advocate for Soil Health**



**To feed the people we must save  
our soil and we must save our soil to  
save the planet**






**“ the history of every nation is eventually  
written in the way in which it cares for its soil”**

**“the nation that destroys its soil, destroys  
itself.”**

Franklin Roosevelt US President 1933 - 1945.





**“Fights over water and food are going to be  
the most significant direct impacts of  
climate change in the next five to ten  
years”**

Jim Yong Kim, President of the World Bank

**“Food security is under threat around the world .... With food insecurity, we must add economic insecurity as scarcities of staple crops cause price surges.**

**One-third of the world’s population already lives in countries experiencing water stress..... it threatens to become a catalyst for conflict.**

**Military minds around the world take climate change very seriously indeed as a threat multiplier with direct consequences for peace and security.”**

**UN Secretary General His Excellency Antonio Guterres**



# Global context

- Arable land is being lost
- Soil carbon levels degraded
- Aquifer water depleted or greatly reduced
- Ground water depleted
- Rivers are heavily polluted
- Climate variability has wide spread impacts



# The Middle East region

- The Fertile Crescent
- Encroaching deserts
- Loss of aquifers
- Depleted river flows
- Salinity issues







# SUSTAINABLE DEVELOPMENT GOALS





# World Soil Charter 2015

## **9 Actions for governments (summarised)**

1. Promote Sustainable Soil Management (SSM)
2. Create favourable conditions for SSM
3. Multi level, interdisciplinary educational and capacity building initiatives
4. Support research programs relevant to end users (farmers)
5. National soil policy
6. Soil practices to mitigate climate change
7. Regulate, limit contaminants accumulation, facilitate remediation of land
8. Develop national soil information system
9. Nationally monitor implementation of SSM & resources

# Australia

- Around 60% of landscape degraded
- Loss of nutrients
- Only 4/39 soil types with adequate soil carbon to hold water
- Soil erosion exceeds soil formation
- Salinity
- Erosion and excision of streams and rivers
- More urban growth and larger cities
- Erratic rainfall, floods, extreme temperatures, droughts, wildfires







# Fundamentals of a healthy soil

- Microbial, fungal, mineral, nutrient balance
- The hydrology – movement of water into and out of the soil
- Diversity of groundcover plants





**ON AVERAGE,  
OF EACH 100 DROPS OF RAIN THAT FALL IN AUSTRALIA...**

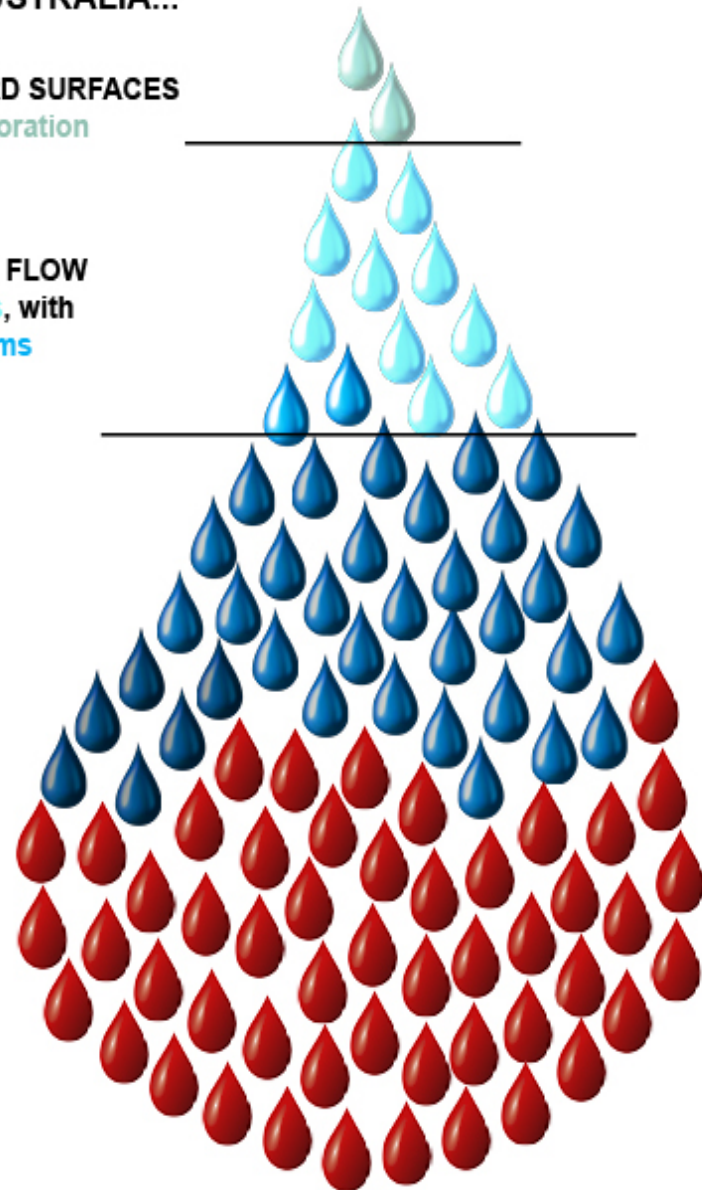
**2 DROPS FALL ON HARD SURFACES**  
stormwater/evaporation

**12 DROPS JOIN OVERLAND FLOW**  
falling into rivers & streams, with  
2 drops ending up in dams

**86 DROPS LAND ON SOILS**  
6 drops infiltrate to groundwater  
30 drops are used by vegetation

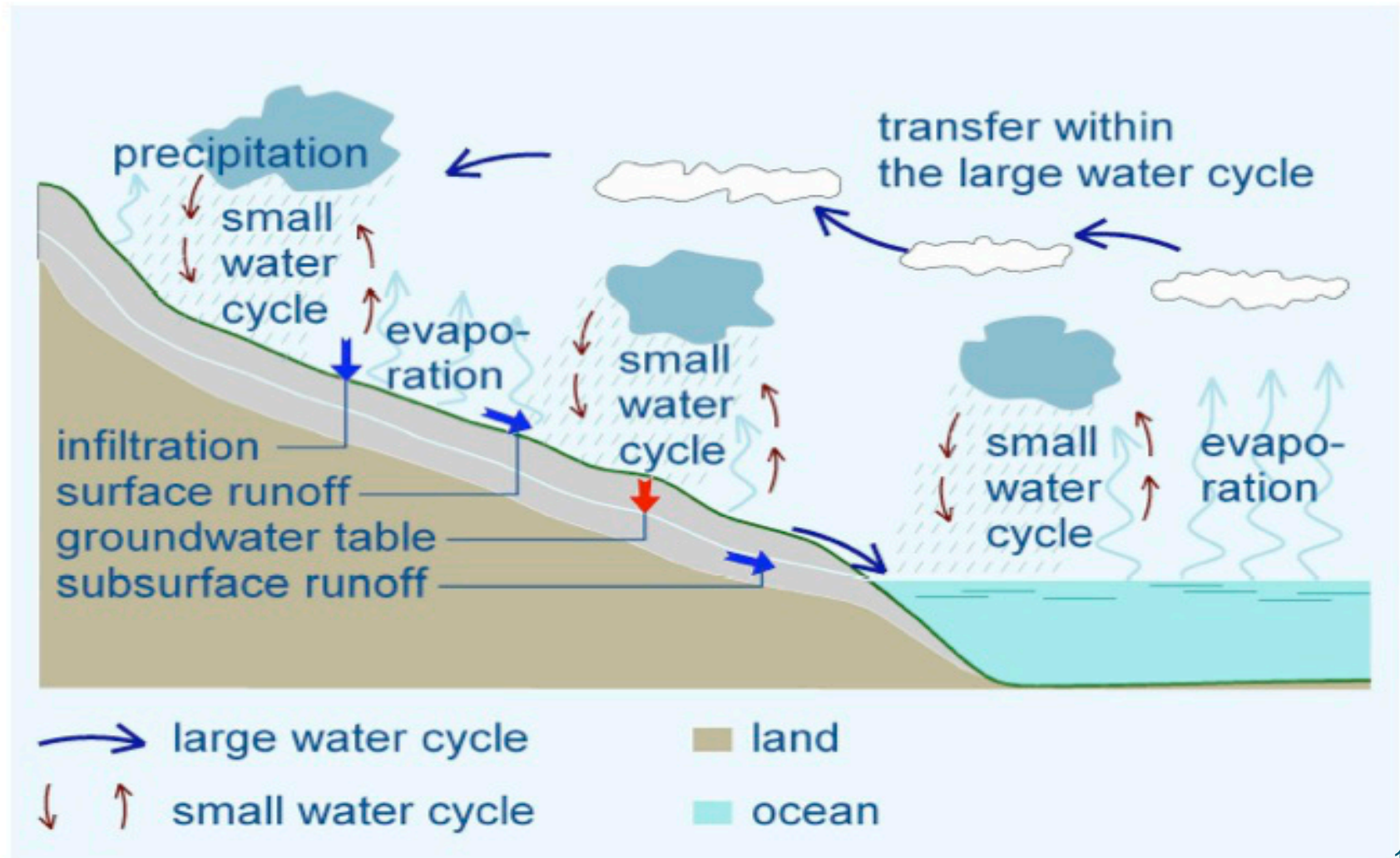
**50 drops are lost to evaporation**


**BY INCREASING THE CARBON CONTENT OF OUR SOIL,  
MORE RAIN WILL BE ABLE TO INFILTRATE FOR  
USE BY VEGETATION AND TO RECHARGE AQUIFERS  
- RATHER THAN BEING LOST TO EVAPORATION**





# The small and large water cycles





Now the sun, moving as it does, sets up processes of change and becoming and decay, and by its agency the finest and sweetest water is every day carried up and is dissolved into vapour and rises to the upper region, where it is condensed again by the cold and so returns to the earth.

**Aristotle, Meteorologica**



# Soil Organic Carbon

- Soil can hold more carbon than the atmosphere and vegetation combined
- Soil carbon enables water filtration and retention
- 1 gram of soil carbon facilitates holding up to 8 grams of water
- Australian farming soils' carbon content is 1.5% or less, should be 3 to 5%
- Photosynthesis ...  
sunlight + carbon dioxide + water = Carbohydrate (C, H, O)

# Other Aspects

- **Nitrification**
- **Phosphate**
- **Vegetation – diversity and coverage**
- **Feral animals**
- **Healthy soil = healthier plants, animals and people**



# Soils for Life

- A not-for-profit organisation promoting regenerative land management practices to achieve improved triple bottom line results.
- Promoting sustainable agricultural production and resilient landscapes
- Providing a proven farmer to farmer, formal mentoring program.
- Up to 100 field studies to profile agricultural enterprises using innovative regenerative landscape practices.
- Reconnecting urban Australia with its rural roots
- Refocus science – CRC – HPS
- Regulatory overburden

[www.soilsforlife.org.au](http://www.soilsforlife.org.au)

Crop grown with natural fertility processes on poor quality, deep sands in WA



5 month old pasture fed merino lamb ready for slaughter just off mum, no drenching, mulesing or chemical residue in the meat.





# Beetaloo Katherine NT



Original



Now



Now



# Wyndham Station NSW



Improved landscape condition enabled re-introduction of cattle & increased herd sizes using controlled watering and rotational grazing



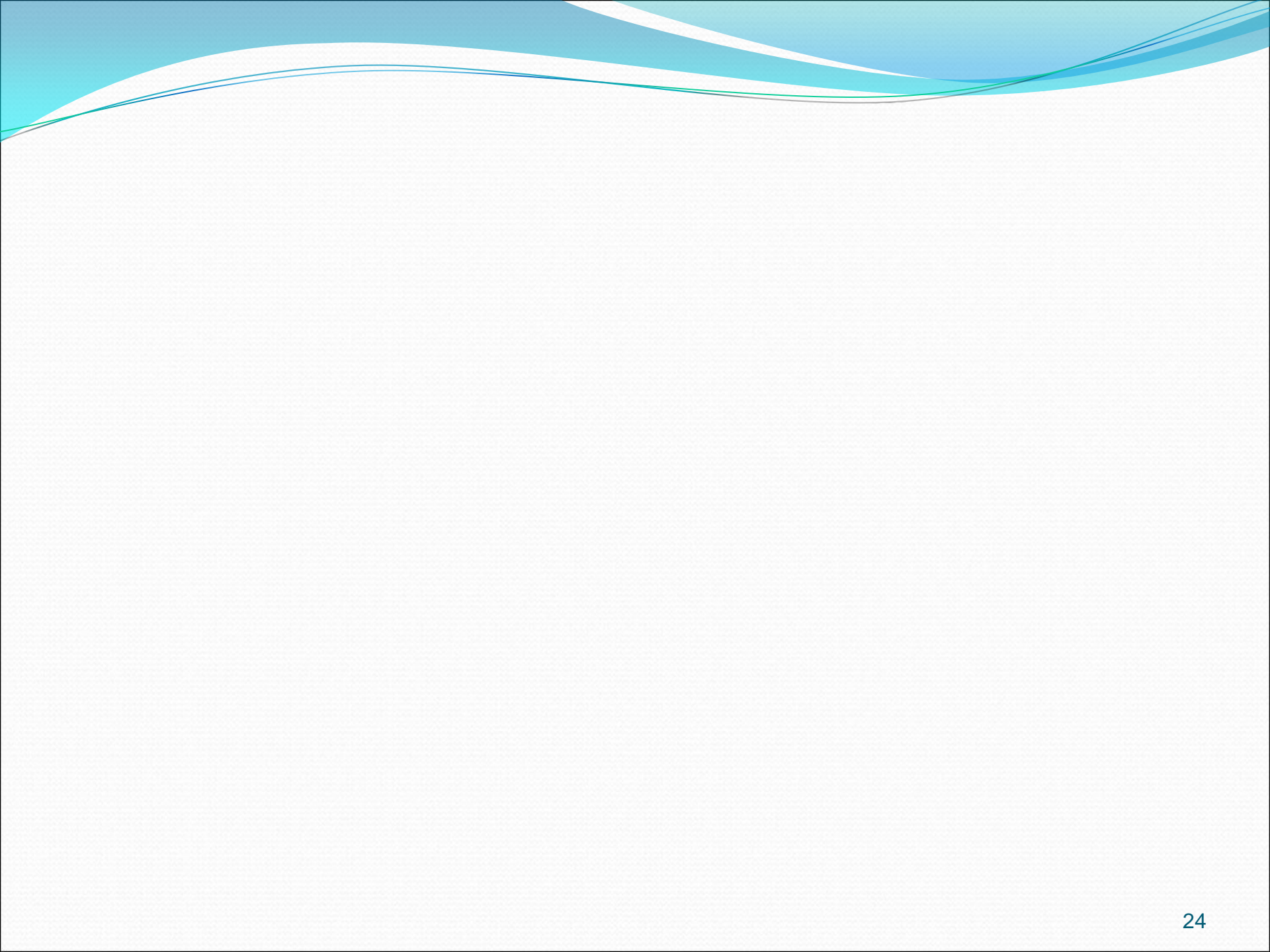
Regrowth in a healing erosion gully



# Jillamatong NSW



- Dense, healthy pastures of native grasses
- Cattle can be fattened all year round
- Floodplains restored – water spread across the property





# A National Soils Policy

“to restore and maintain the health of the  
Australian agricultural landscape such  
that it is fit for purpose”



# **National Natural Strategic Assets**

**1. Soil**

**2. Water**

**3. Vegetation**








# **Future Directions International**

**[www.futuredirections.org.au](http://www.futuredirections.org.au)**



- 
- Restore and maintain the health of the Australian agricultural landscape
  - Soil, water, plants – **national natural strategic assets**
  - Recognise farmers as primary carers of 60% of the Australian continent
  - Reconnect urban Australia with its rural roots – school and community gardens
  - Stocktake of knowledge – focus research on gaps
  - Long term research base with easy access to information by agricultural community







Looking after our soil and water  
is a strategic imperative for  
Australia's future wellbeing.

**To save the planet,  
first save the soil.**