



# Swedish University of Agricultural Sciences

## **The dryland context**

Annual workshop for Triple L 28 November 2016  
*Professor Anders Malmer, Director SLU Global*

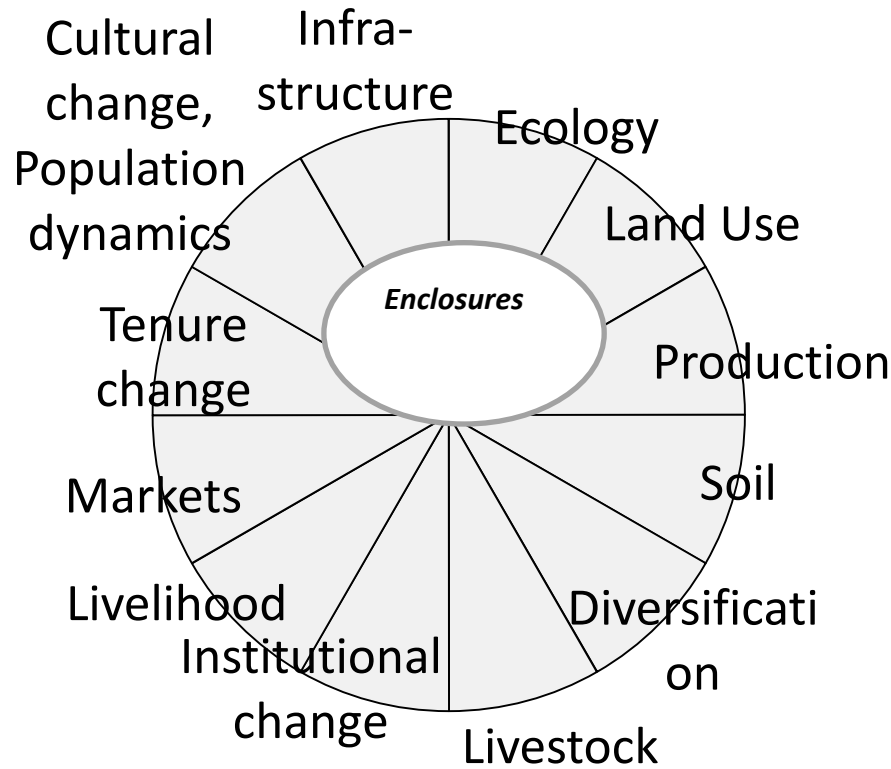


# Drylands development

- Water
  - Rainwater harvesting
  - Reducing surface runoff
  - Water management
- Livestock
  - Fodder/grazing management
  - Animal health/production
- Innovative cultivation
  - Agroforestry/many crops
- Intensification/restoration
  - Landscape perspective
  - Ecosystem services
  - Climate adaptation
  - Value chains



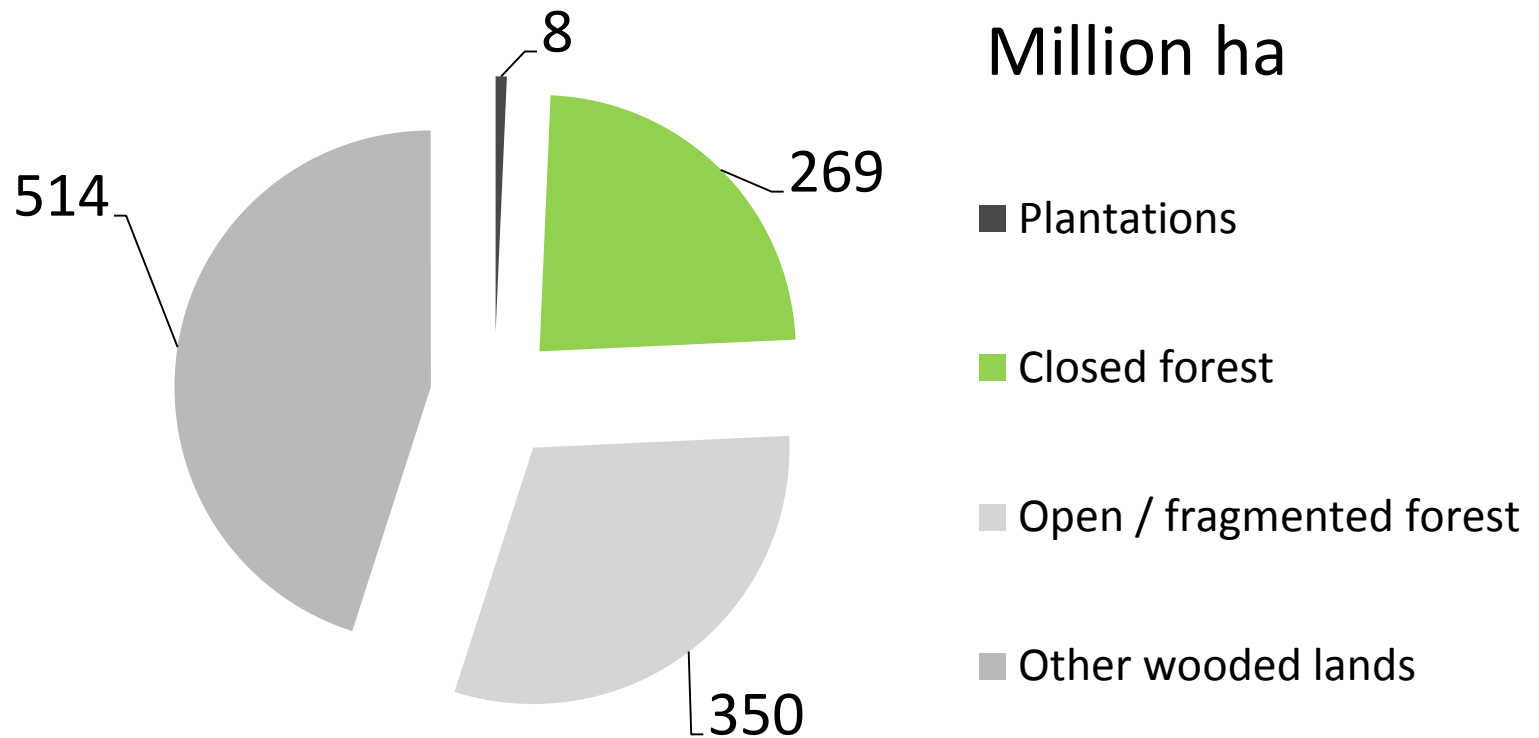
# Triple L, Land, Livestock and Livelihood Dynamics in Dryland Systems



SLU, Lunds universitet, Göteborgs universitet, Chalmers, Jomo Kenyatta University of Agriculture and Technology, Kanyatta University, ICRAF & ILRI

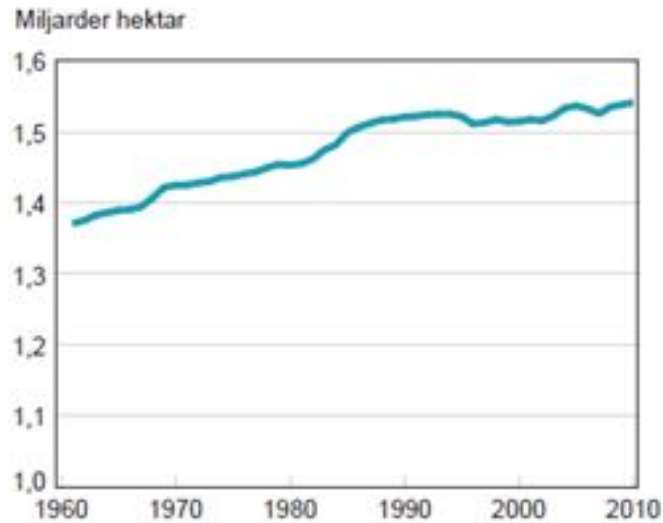
# The role of trees

## 1) Closed vs. open forest - Africa



# Is there land enough for food, fibre and fuel for 2030?

Arable land in the world in 1961–2010, billion hectare



Källa: FAOSTAT 2013

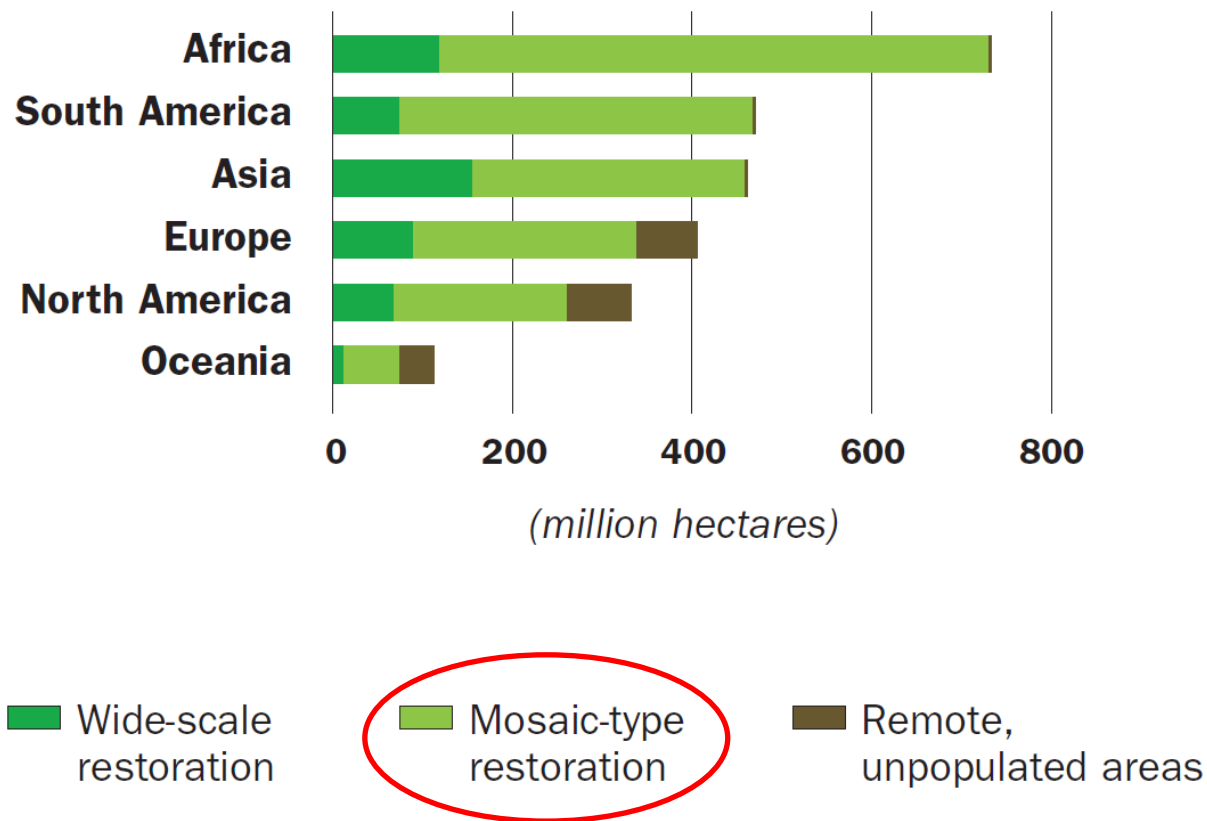
	Estimates	LOW	HIGH
Categories			
Additional croplands		81	147
Additional biofuel crops		44	118
Additional grassing land		0	151
Urban expansion		48	100
Industrial forestry expansion		56	109
Expansion of protected areas		26	80
Land lost to land degradation		30	87
TOTAL		285	792

Lambin & Mayfroidt 2011

Arable land increased with 200 milj ha in 50 years.  
In another 20 years it needs to increase another 80 – 150 milj ha  
On the side of other bio-based production and urban expansion...

## Land-use expansion may be physically possible, but probably outside safe planetary boundaries for deforestation, biodiversity and other aspects.

According to World Resources Institute there are 2 000 milj ha of degraded land (forests and converted forests) that may be subject to restoration for increased bio-based production.



Mosaic landscape in terms of :  
Ecosystems, land-use, stakeholders and stakeholder  
dependence-areas, ownership, tenure, etc.



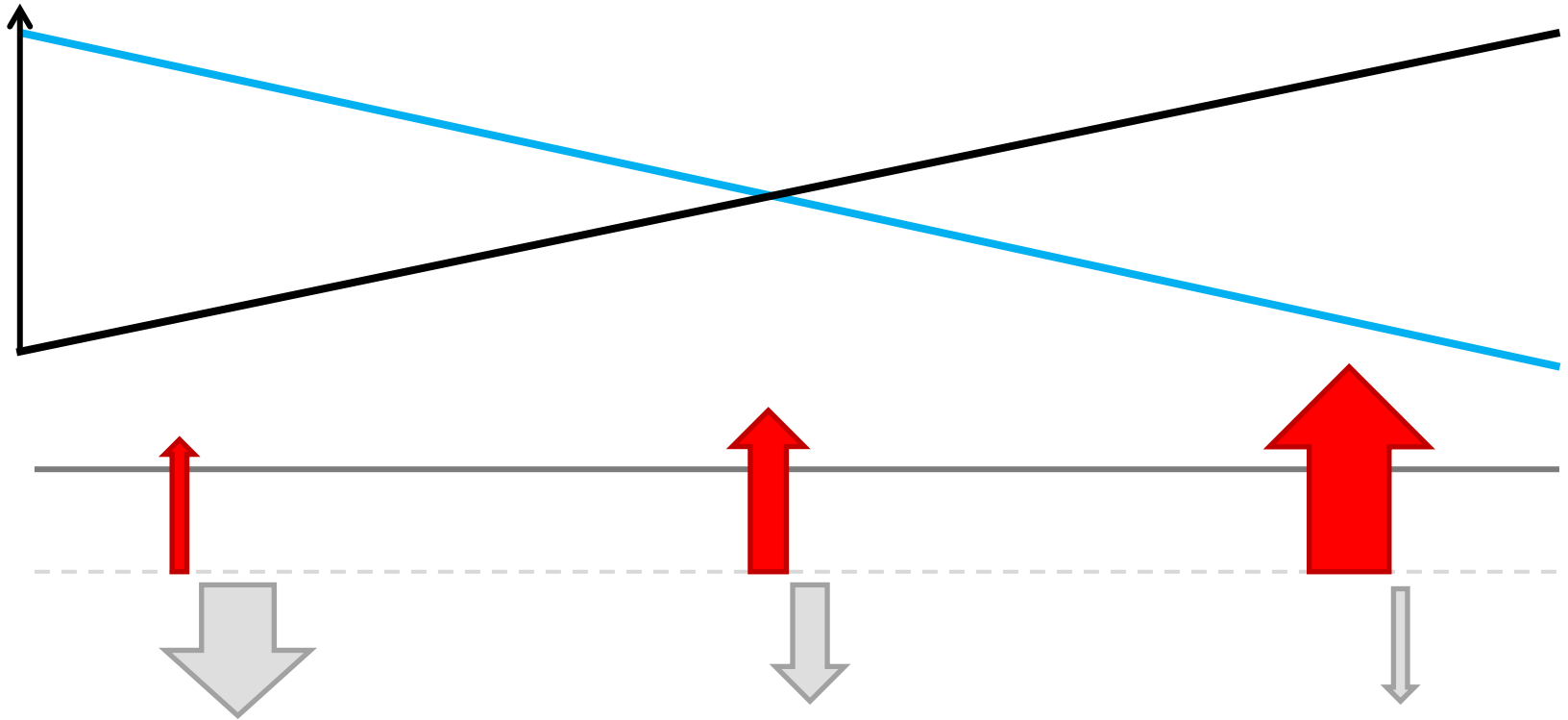
Most landscapes suitable for "restoration" are filled with people  
and change has to include them.



# The role of trees 2) water

## The current paradigm: "Trade-off model"

■ Carbon    ■ Groundwater recharge    ■ Evapotranspiration

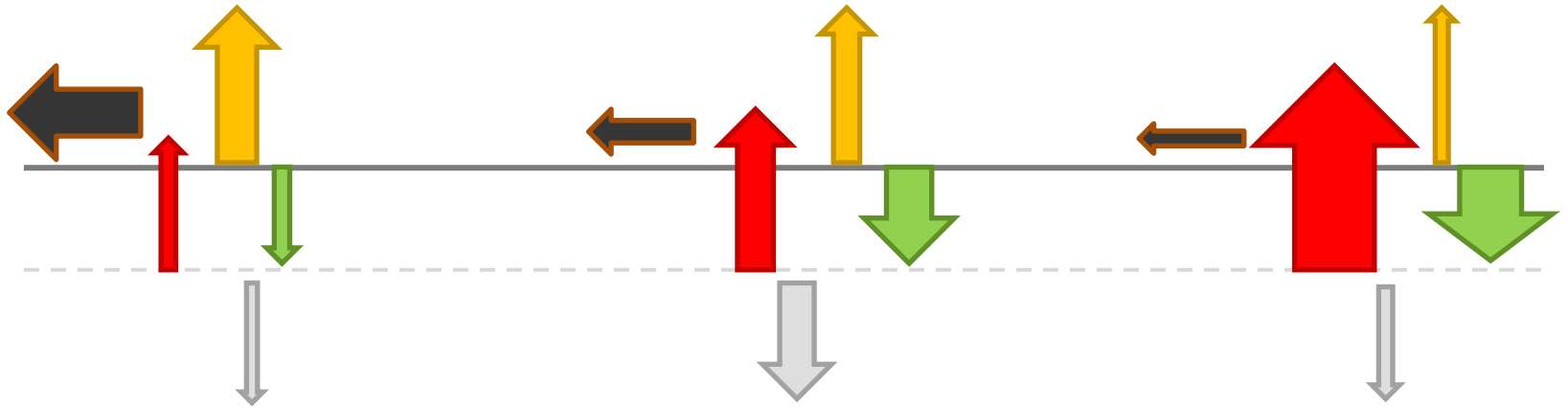


■ Transpiration ■ Surface runoff ■ Soil evaporation ■ Infiltration ■ Groundwater recharge

Groundwater recharge

# Optimum tree density model

(Ilstedt et al Nature Scientific Reports 2016)



# Land Livestock and Livelihoods

