

Achieving zero net land degradation: impacts on climate change issues

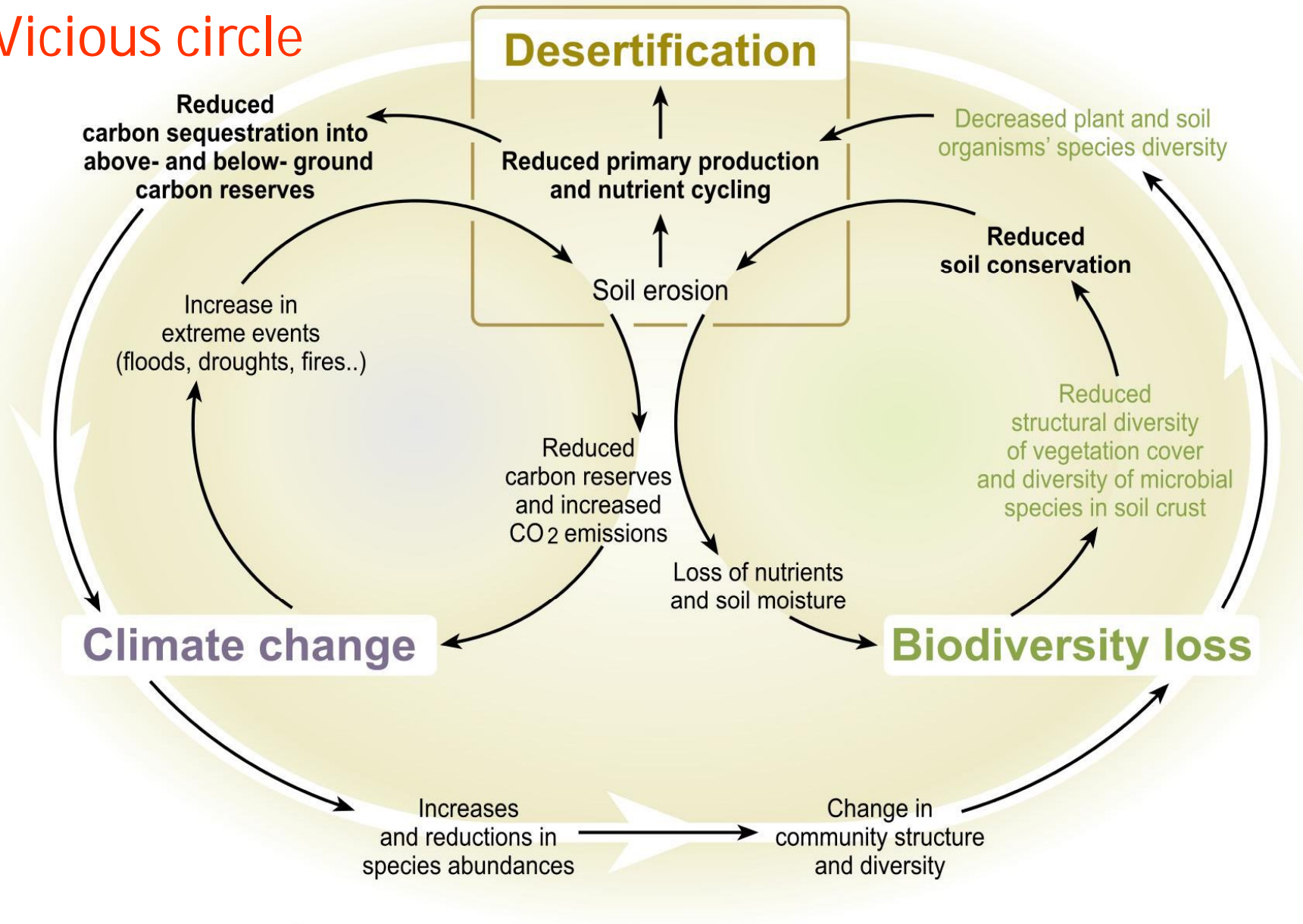
How the world can curve carbon emission by setting a sustainable development goal on land and a zero net land degradation as a target

*Land degradation and climate change:
turning **vicious** to a **virtuous** cycle*

Uriel Safriel
Center for Environmental Conventions
Blaustein Institutes for Desert Research, Israel

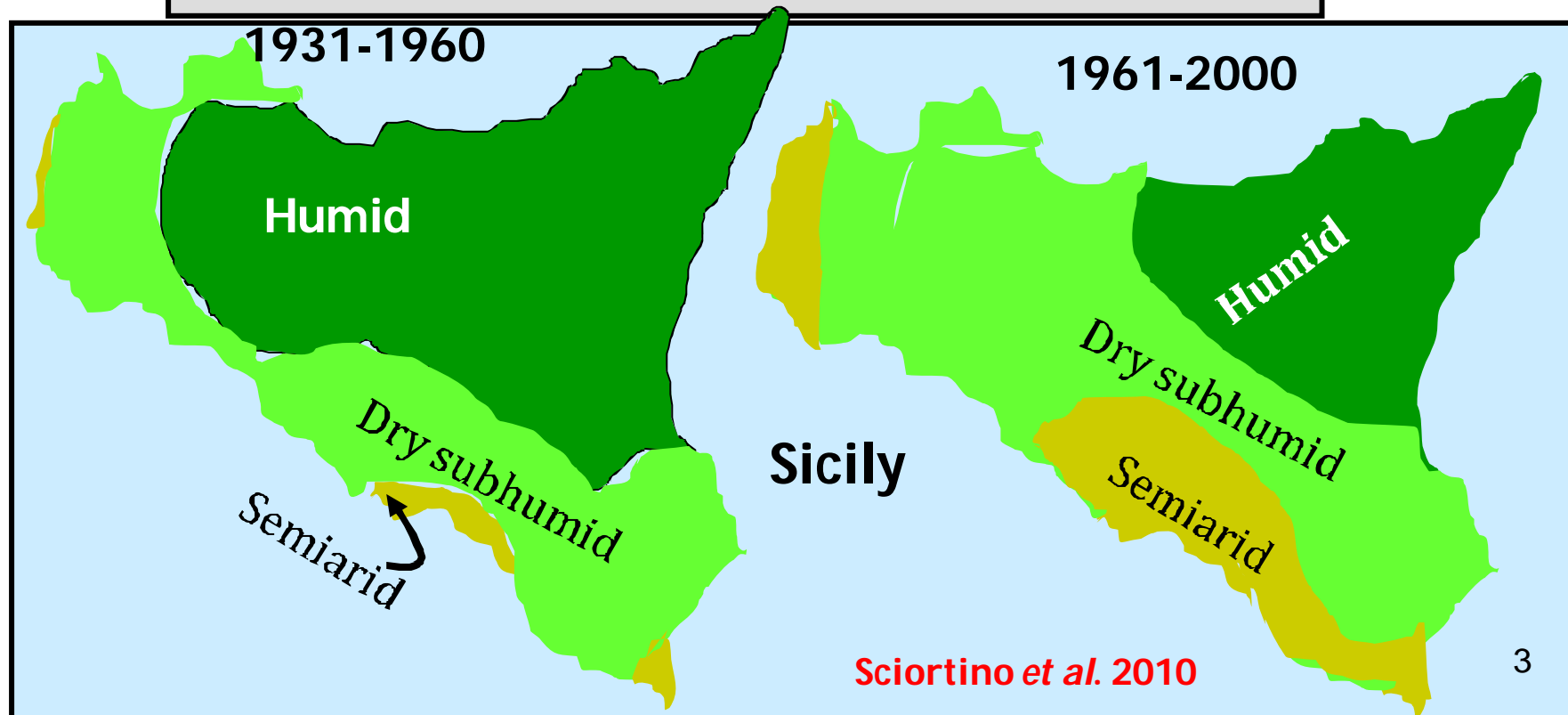
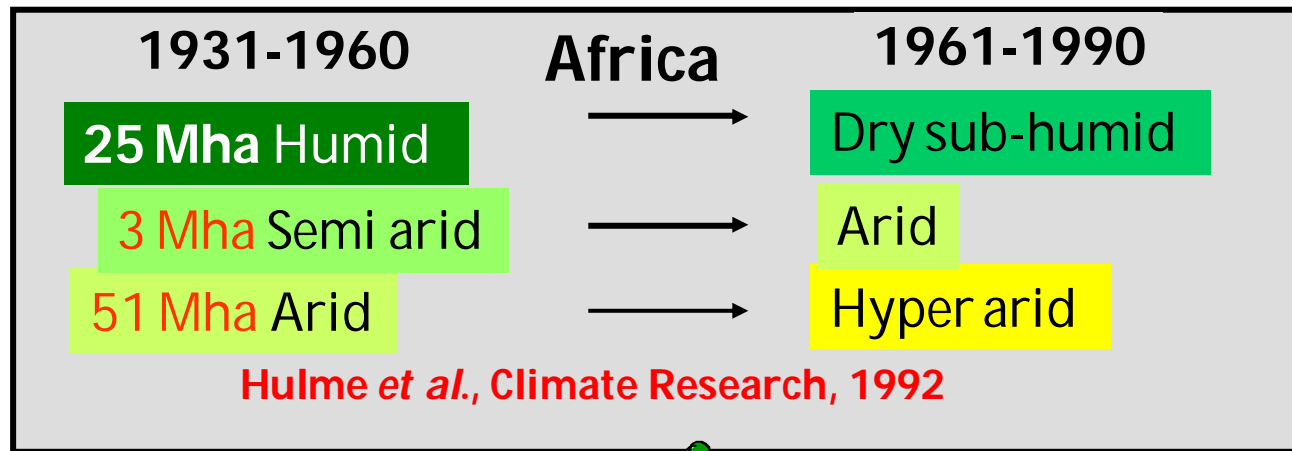
UNFCCC - COP17, 28 Nov - 9 Dec 2011, Durban, South Africa

Vicious circle

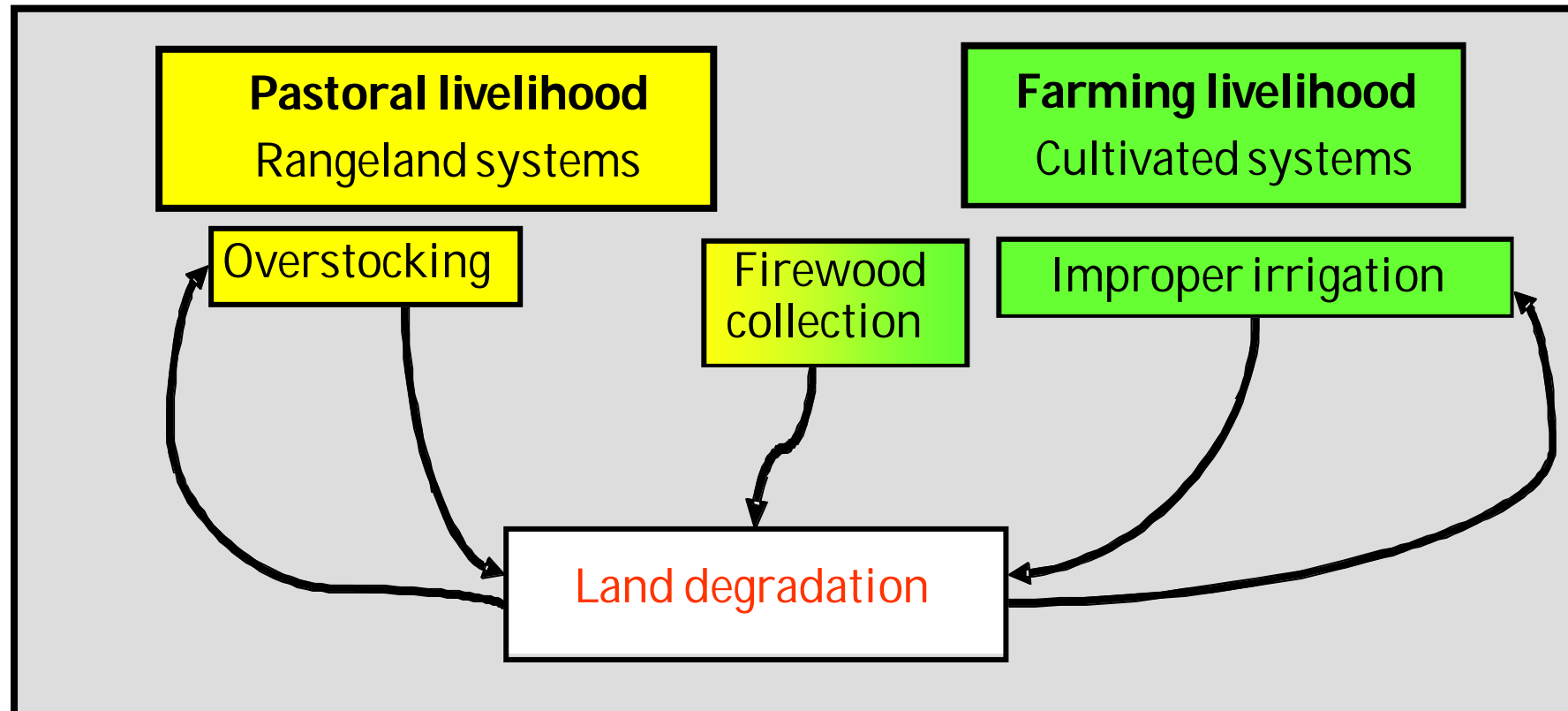


Source: Millennium Assessment (2005)

Climate change-induced change in Aridity Index (P/PET) - productivity reduction



Much land degradation is **directly** driven by humans at the local scale



Of 24% of global land degraded in recent 20 years:

Drylands (41% of land) 22%

Nearly half of cultivated systems - in drylands
38% of land-generated food provided by dryland ecosystems

Drylands are important

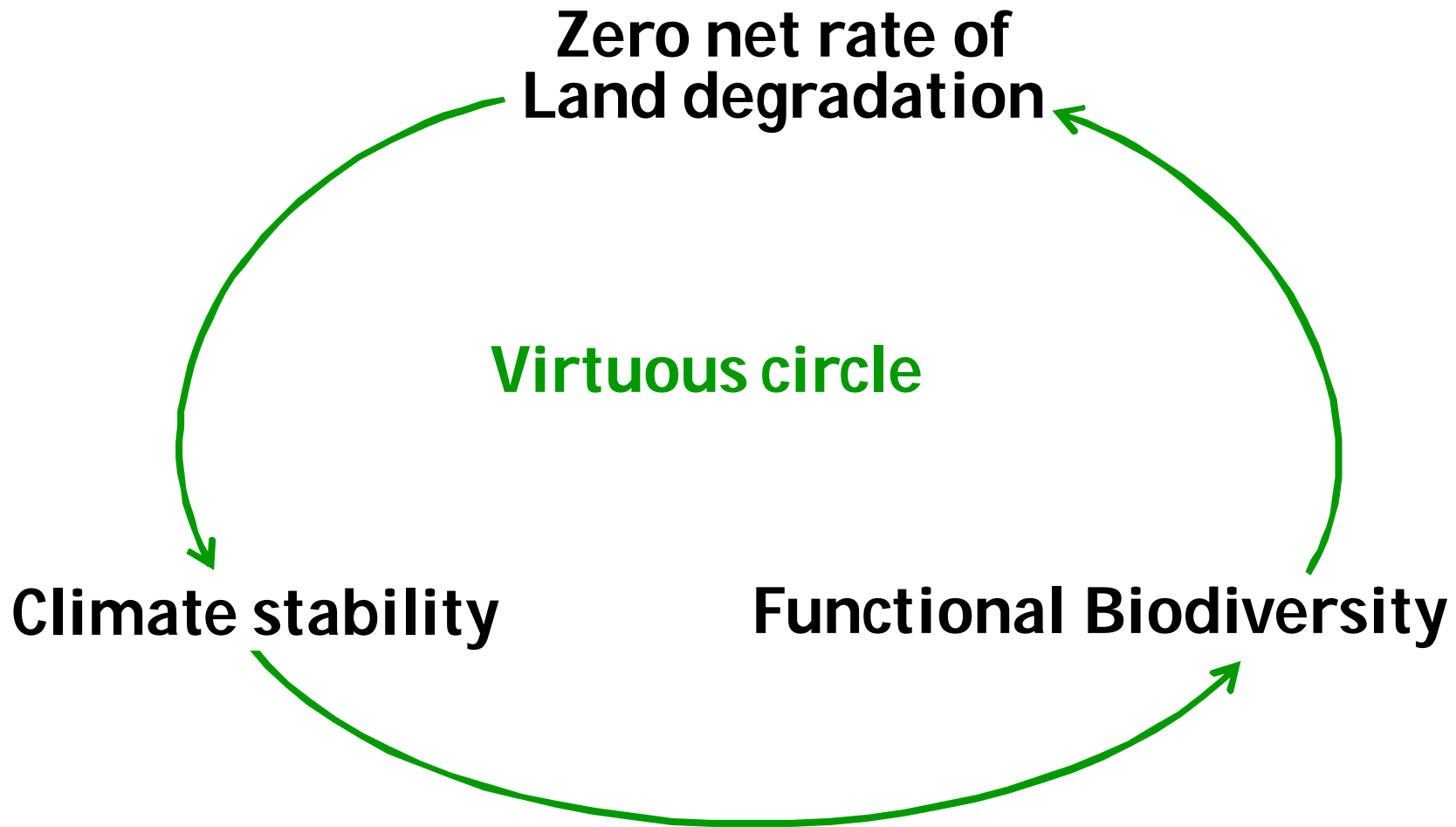
- Relatively low recent degradation
- Contribute much to global food security

Drylands are a challenge

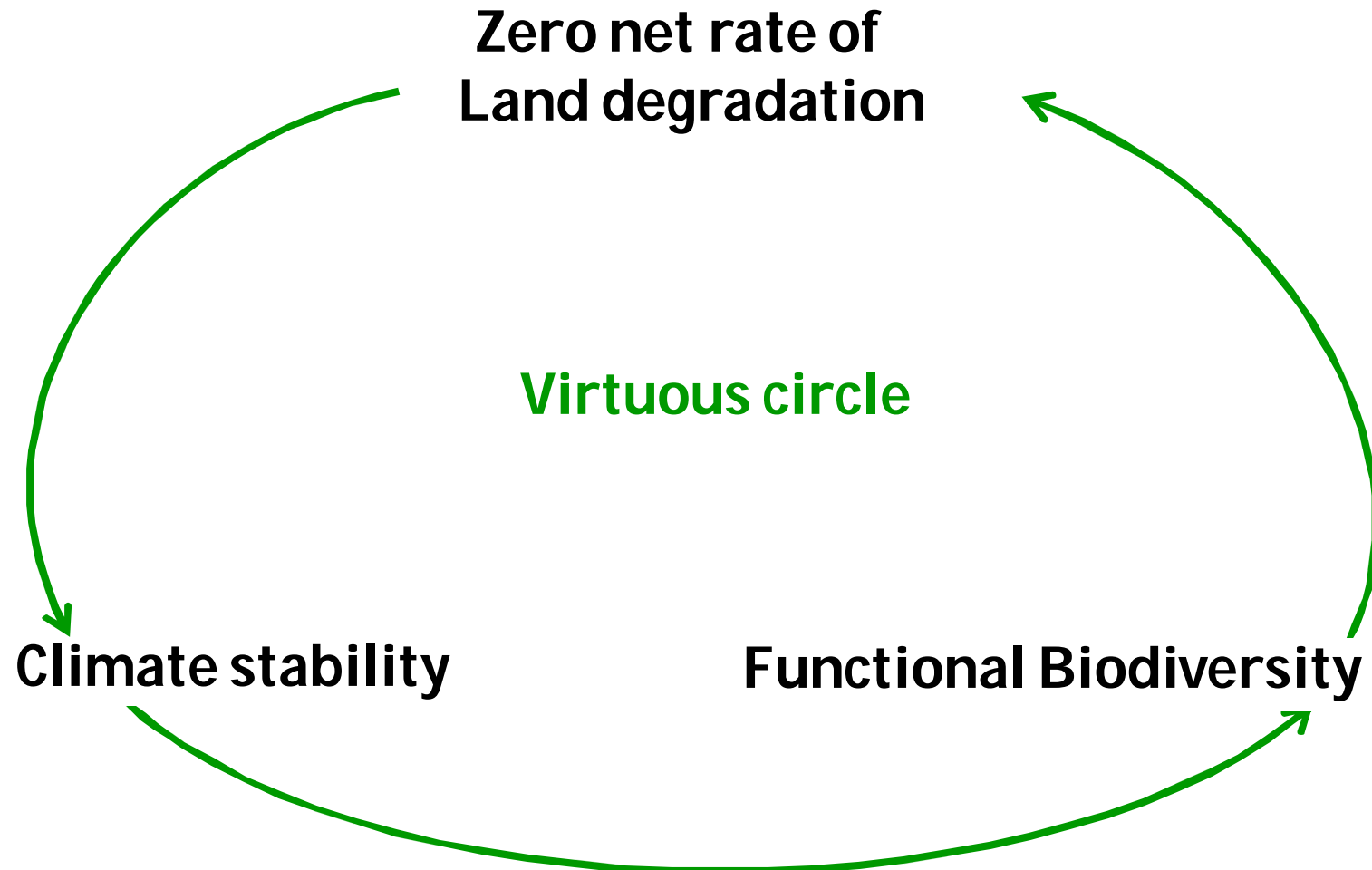
- Much historic degradation
- Low natural productivity

Start with drylands

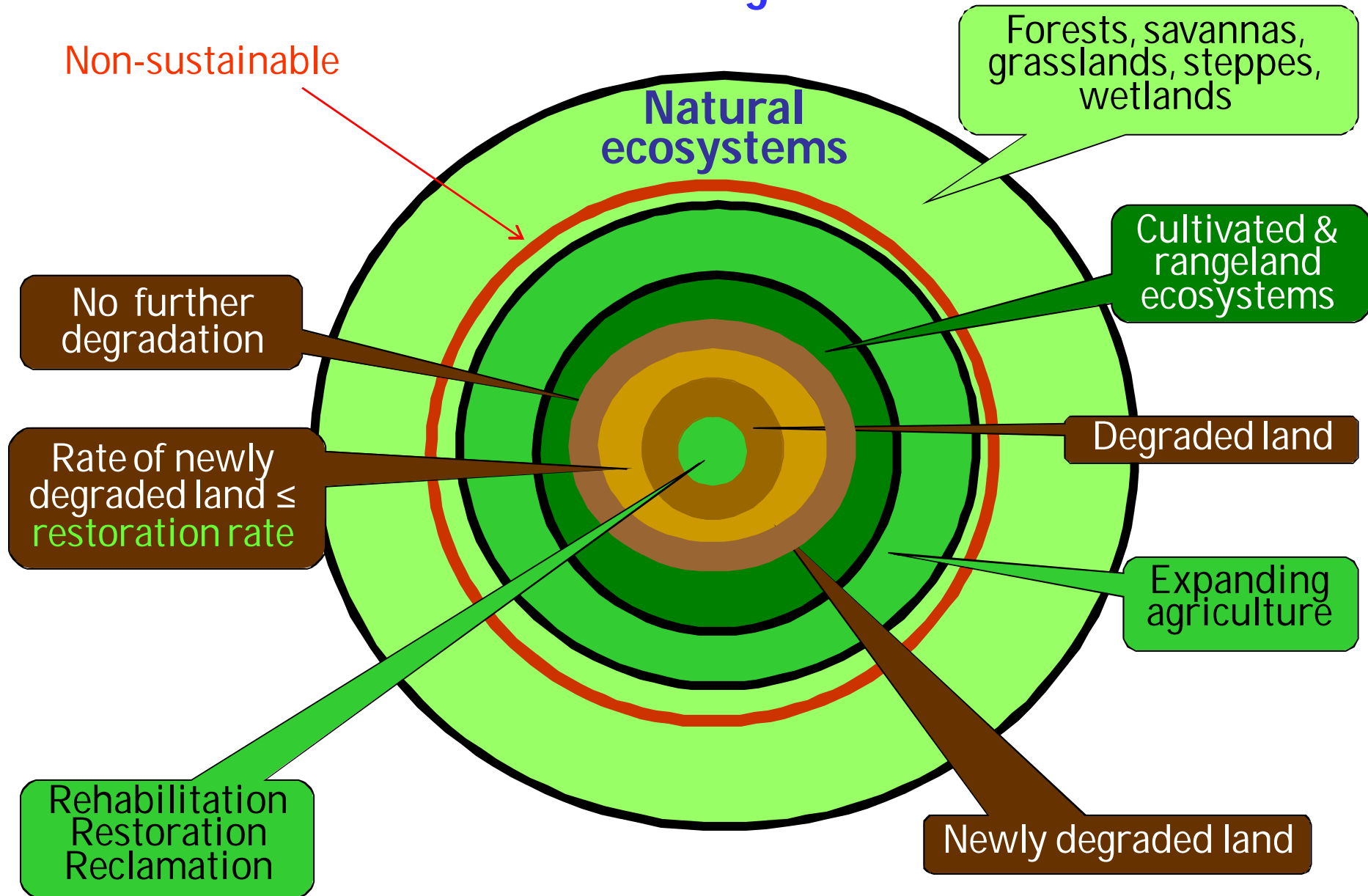
**If the challenge in drylands is met
solutions will also work well in non-drylands**



How to get there?



Zero net rate of land degradation



UNCCD desertification

is land degradation
in drylands

**Zero net rate of
Land degradation**

Virtuous circle

Rate of newly
degraded land \leq
restoration rate

No further
degradation

Political framework to make it reality

Climate stability

UNFCCC

Functional Biodiversity

CBD

What can be done in drylands and likely to apply to non-drylands too?

Targets

Rate of newly degraded land \leq restoration rate

No further degradation

Responding sustainably to increased demand

Actions

Restoration

Avoiding degradation of currently used land

Sustainably promoting food production for projected population growth

Outcomes

Increasing C stocks

Reducing C emissions

Reducing poverty

Food security

What can be done in drylands and likely to apply to non-drylands too?

Restoration: Soil depleted

Afforestation

Runoff harvesting

- Builds soil
- Halts erosion
- Regulates water
- Promotes forage
- Provides firewood

Transfer to patch cultivation

Below-ground SOM
Above-ground stand



Increasing C stocks

Reducing C emissions

Reducing poverty

Food security

What can be done in drylands and likely to apply to non-drylands too?

Restoration: Soil salinized



Halophyte cultivation

Domestication
Brackish water irrigation

- Vegetable (whole plant)
- Removes salinity



What can be done in drylands and likely to apply to non-drylands too?

Restoration: Rangeland degraded



Low degradation
Removing pressure
Severe degradation
Investments:
• terracing
• bush removal
• seeding



What can be done in drylands and likely to apply to non-drylands too?

Avoiding degradation of currently used land

Water

- Drip & plastic cover
- Reduce evaporation loss
- Treat wastewater
- irrigation reuse
- Use natural water regulation service
- Conserve natural ecosystems
- Do not -**
- Distant water transport
 - Desalination

Finance & marketing

- Reducing
- Dependency on external inputs
 - Exposure to financial risks
 - Negative impacts of international trade
 - Small-scale, low external input and low cost solutions
 - Focus on local seed and livestock varieties
 - Concentrate on local food systems

Knowledge

Develop effective people-oriented extension services



What can be done in drylands and likely to apply to non-drylands too?

Avoiding degradation of currently used land

Reduce pressure on land's services of biological productivity

Alternative land uses and livelihoods

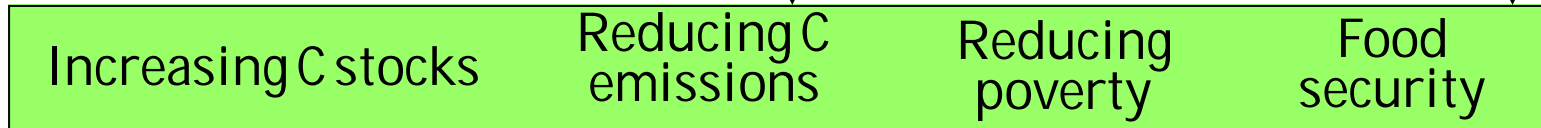
Aquaculture

- Less land
- Less water
- More biological products of economic value/resource unit
- Fish, crustaceans
- Edible, ornamental



Uni-cellular algae (*Haematococcus*)

- Feed additive (pigment)
- Health additive (antioxidant)



What can be done in drylands and likely to apply to non-drylands too?

Avoiding degradation of currently used land

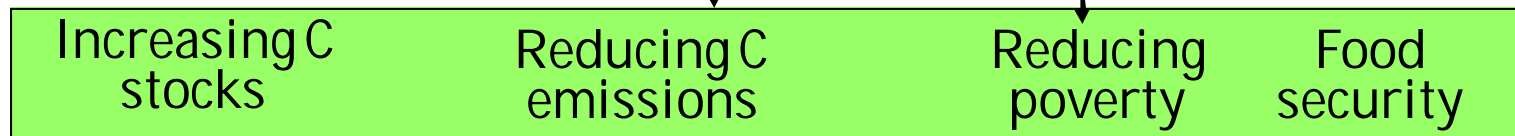
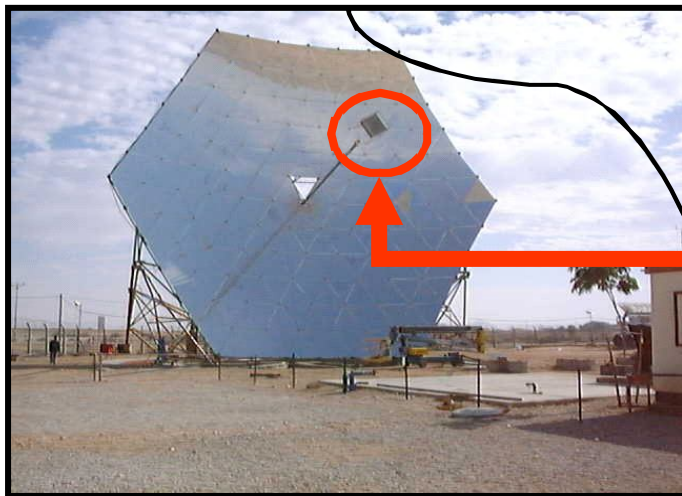
Reduce pressure on land's services of biological productivity

Alternative land uses and livelihoods

Tourism

- Ecotourism
- Agrotourism

Solar energy export



What can be done in drylands and likely to apply to non-drylands too?

Securing food provision for projected population growth

Avoid expansion into natural ecosystems

Sustainable increase of resource (soil and water) use of currently used land

Farming systems

- Intercropping cultivation systems

- **Cultivate salines - 3,230,000 km²**

domesticate and breed halophytes

Pastoral systems

- Sylvi-pastoral systems
- Agro-pastoral systems



Increasing C stocks

Reducing C emissions

Reducing poverty

Food security

Conclusions and recommendations

- Setting and attaining the **target of zero net rate of land degradation** could **reverse** the vicious cycle that mutually exacerbate land degradation, climate change and biodiversity loss
- **Reducing** rates of land **degradation** and **restoring recent** and **historically** degraded lands, would reduce poverty of land users and increase global food security

Conclusions and recommendations

- The same measures, at the same time, reduce emissions and increase sequestration, thus -
- Contribute to reducing global warming and moving forward the climate system towards stability at the aspired GHG atmospheric concentration

Conclusions and recommendations

- Meeting future increased needs **not** through **expanding agriculture** at the expense of natural ecosystems, but -
 - through **non-degrading intensification** of production in existing and restored production systems
 - Can be driven by **existing** agrotechnics empowered by **innovative**, non-conventional approaches applied to non-degraded and restored lands
 - Will be supported by services provided by the non-transformed natural ecosystems

Conclusions and recommendations

- Successful practices for attaining the targets in drylands could be effectively adapted and adopted in non-drylands
 - Operationalizing the zero net rate of land degradation target would require -
 - an intergovernmental yet independent scientific assessment mechanism
 - an international political framework which, with minor adaptation could be provided by the UNCCD.
 - The interlinkages between the subject-matters of Rio Conventions, for worse if ignored or for good if action is taken, should expedite the conventions' joint implementation
-