

Land Degradation and Desertification

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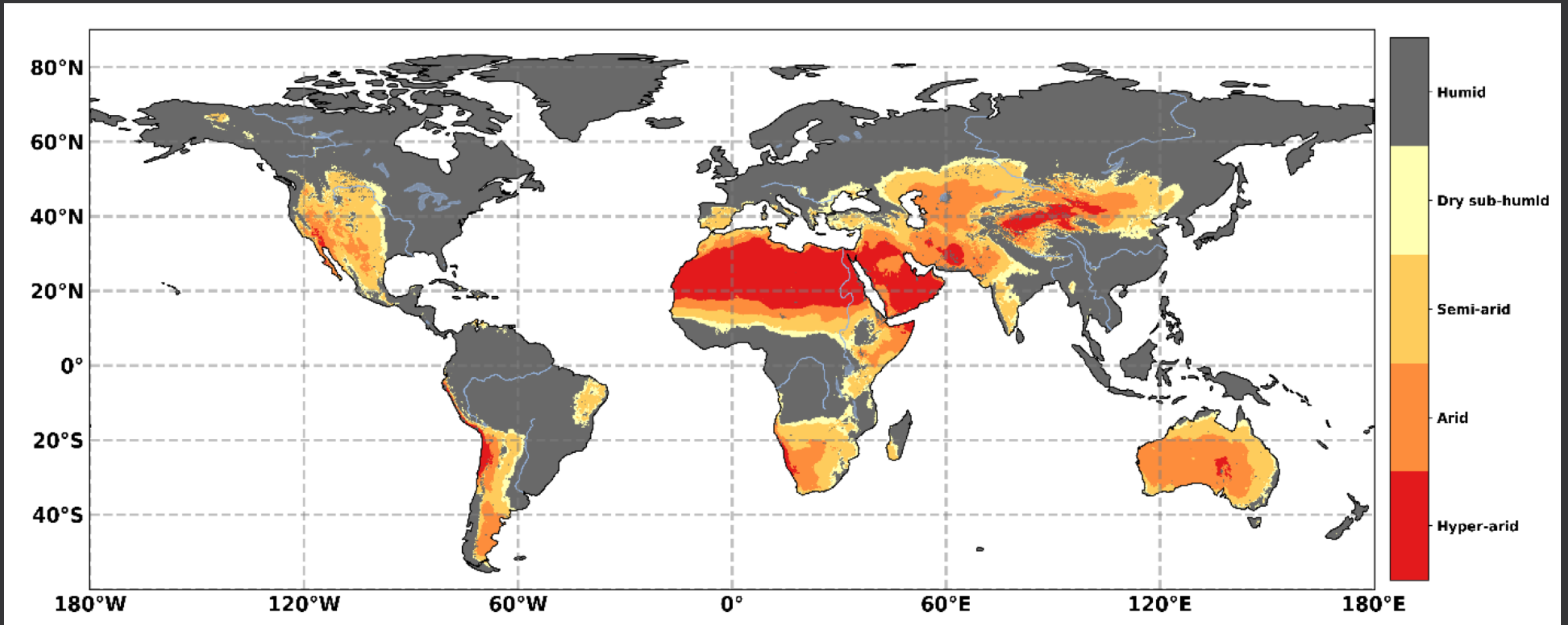
Definitions

- **Land degradation** is defined as a negative trend in land condition, expressed as long-term reduction or loss of at least one of the following: biological productivity, ecological integrity, or value to humans.
- **Desertification** is defined as land degradation in arid, semi-arid, and dry sub-humid areas (referred to as *drylands*).
- Both *land degradation* and *desertification* can be caused by direct or indirect human-induced processes including anthropogenic climate change.

Key points

- Land degradation and desertification are serious, global problems that affect people, ecosystems and livelihoods.
- There are multiple and interacting causal factors which make it challenging to attribute land degradation/desertification to any one driver.
- Climate change can be considered as a threat multiplier.
- **Land degradation** can be avoided, reduced or reversed by implementing sustainable land management (SLM) practices that provide many co-benefits, including adaptation to, and mitigation of, climate change.
- **Desertification** is harder to reverse, but SLM practices combined with indigenous local knowledge can increase adaptation.
- Land degradation and desertification exert feedbacks on climate through changes in surface properties and CO₂ emissions changes.

Distribution of global drylands



*>40% of global land area
>38% of the global population (~3 billion people,
90% of whom live in developing countries)*

Abatzoglou et al., 2018 (in Ch3)

Land degradation / desertification and climate change, both individually and in combination, have profound implications for societies in which livelihoods are highly dependent on land and rainfall.

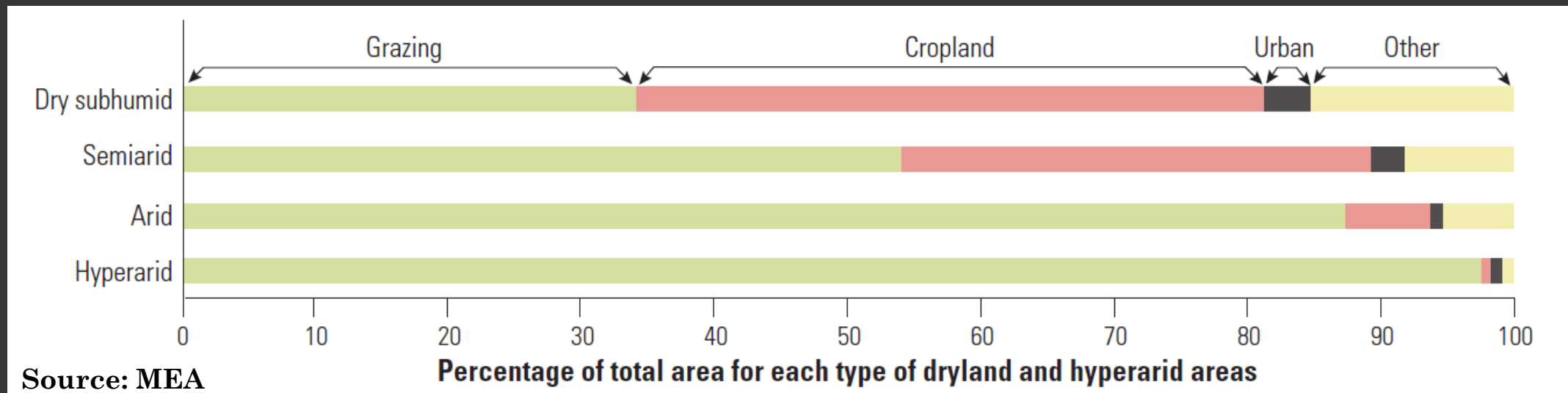


Image: CGIAR

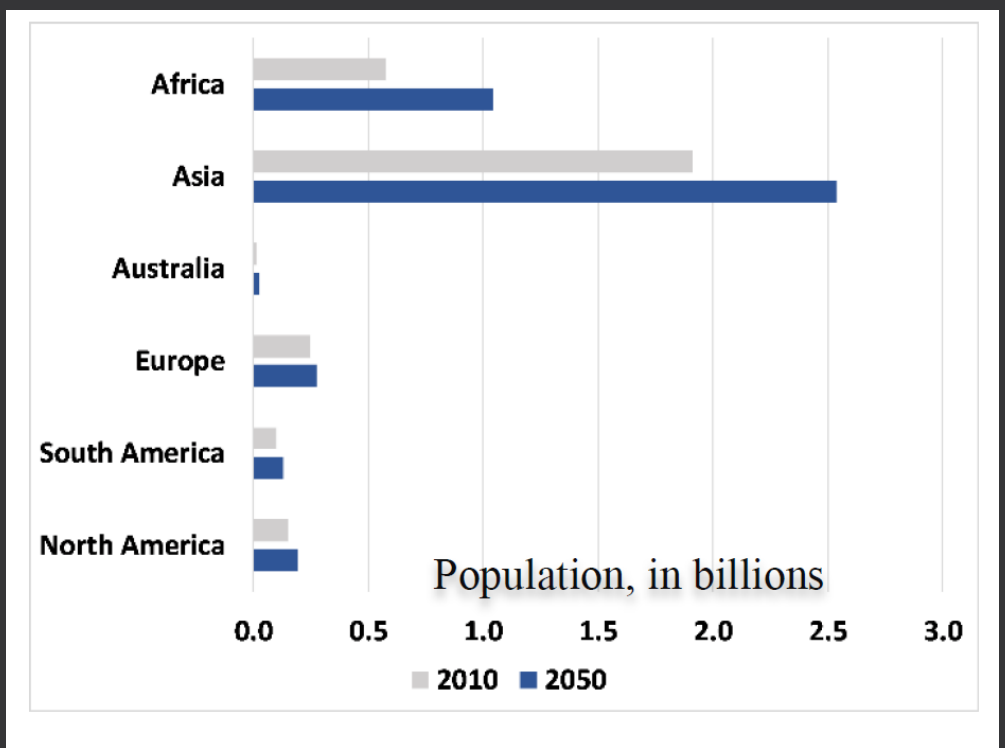
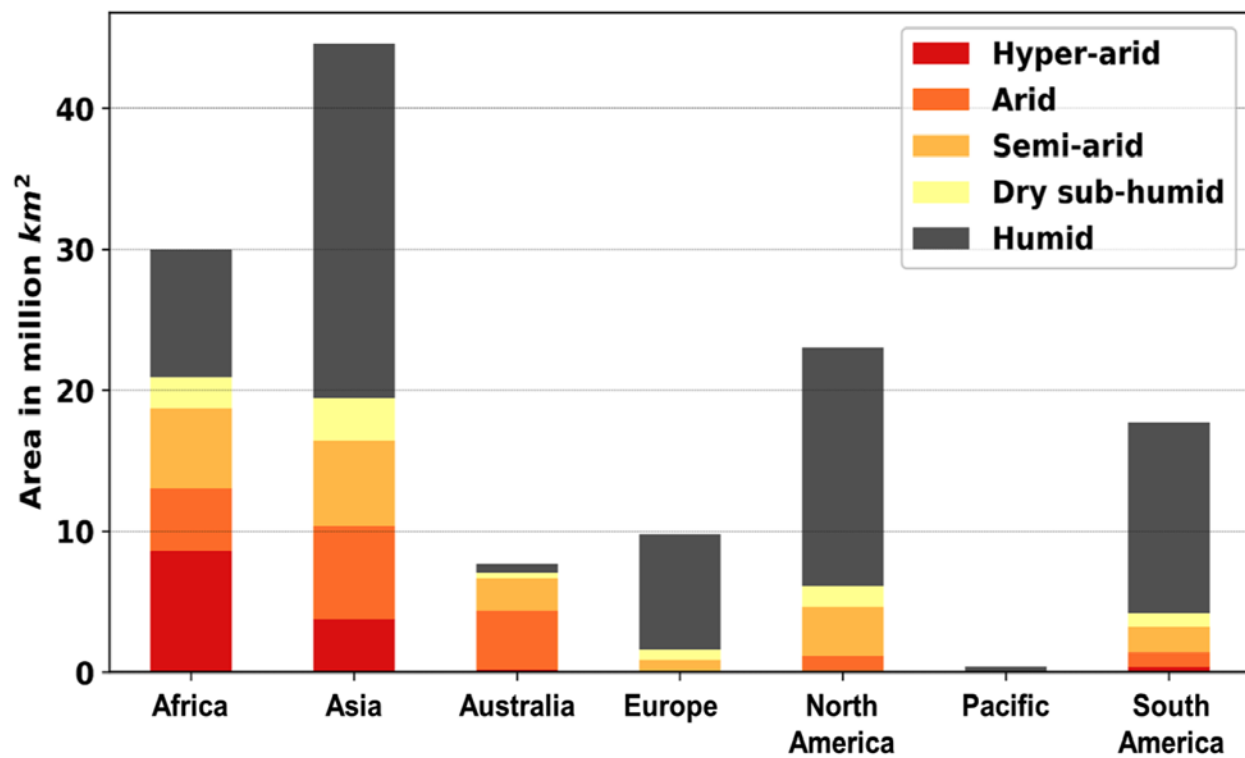


Image: Oxfam

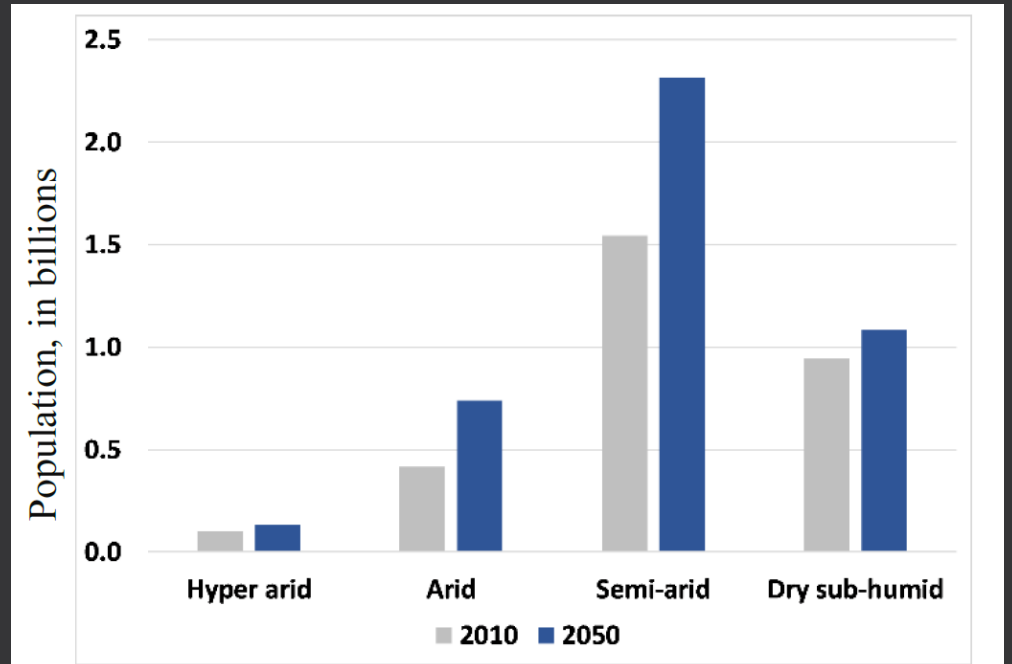
Drylands support 50% of global grazing lands



Pastoralists make up a large % of the population and contribute to the economy



- More than 3.2 Bn people around the world affected by land degradation (UNCCD)
- More than 25% of global land surface affected by land degradation (UN; Ch4)
- Estimated that the global economy will lose ~\$23 trillion by 2050 through land degradation (UN).



Land degradation and Desertification Drivers

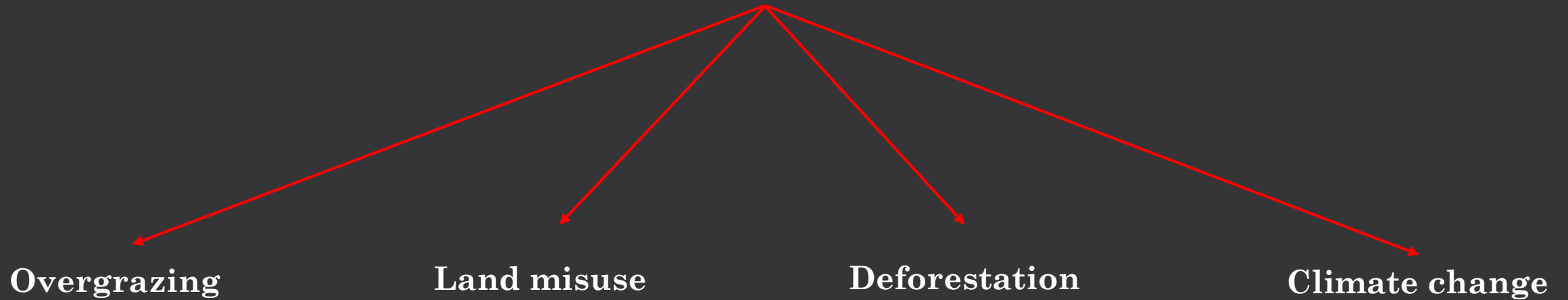


Photo credit: Maximilan Buzun,
Alamy Stock photo



BBC.co.uk

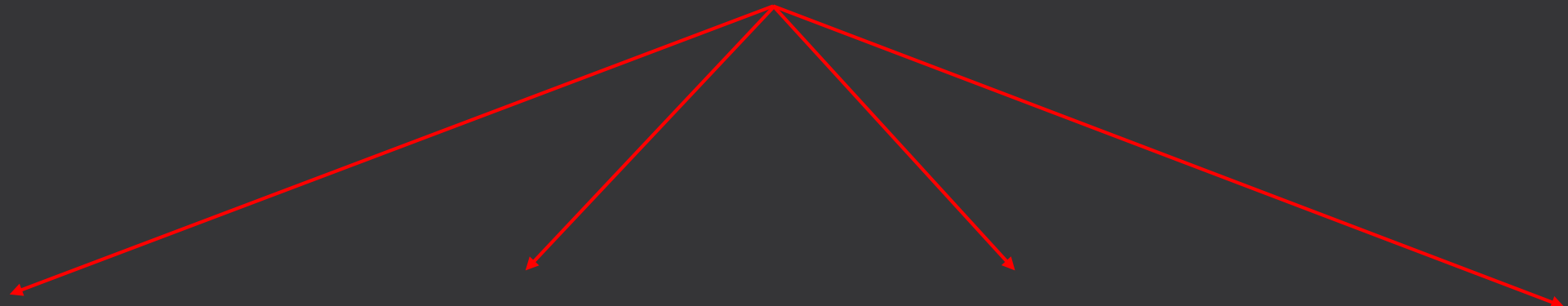


Photo credit: Joeg Boethling Alamy
Stock photo



Photo credit: Pxhere.com

Land degradation and Desertification Consequences



Change in ecological status



Decline in land productivity



Credit: Africa Center for Strategic Studies

Potential conflict for resources



Credit: Nature.com

Migration



Credit: Medium.com

Impacts on Food and Water Security

Most undernourished populations in the world (FAO 2018):

Sub-Saharan Africa (28.8%)

East Africa (31.4%)

South Asia (33.7%)

Degraded land impacts the water balance and water availability through altered vegetation cover, soil properties and land surface characteristics.



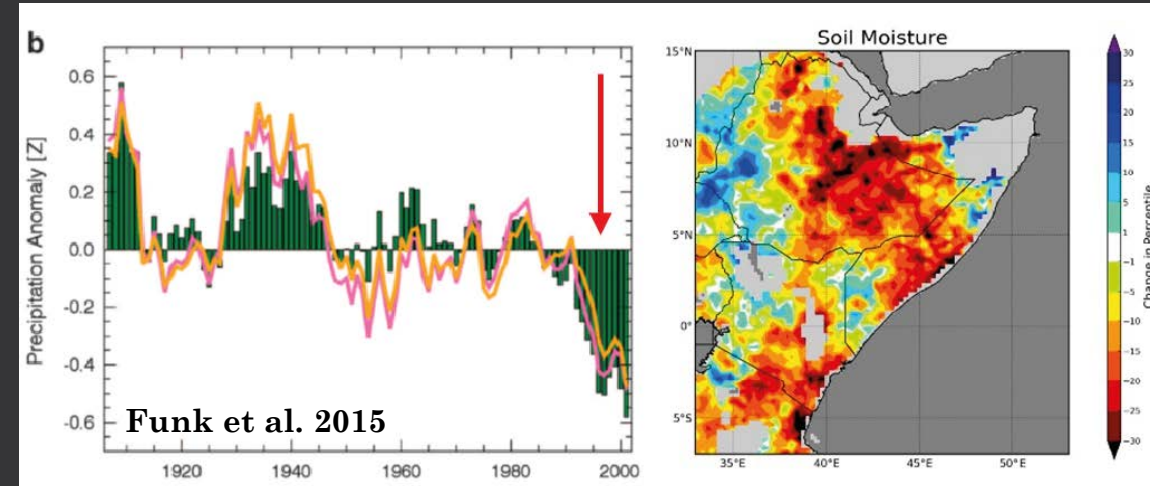
Photo credit: Farah Abdi Warsameh/AP

Climate change compounds the effects of land degradation and desertification and decreases social resilience:

Increased frequency/intensity droughts

Increased intensity of rainfall events ⇒

Reduced capacity to adapt and recover

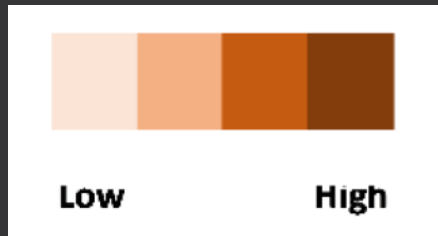


Impact of desertification on SDGs

Magnitude of impact



Level of confidence

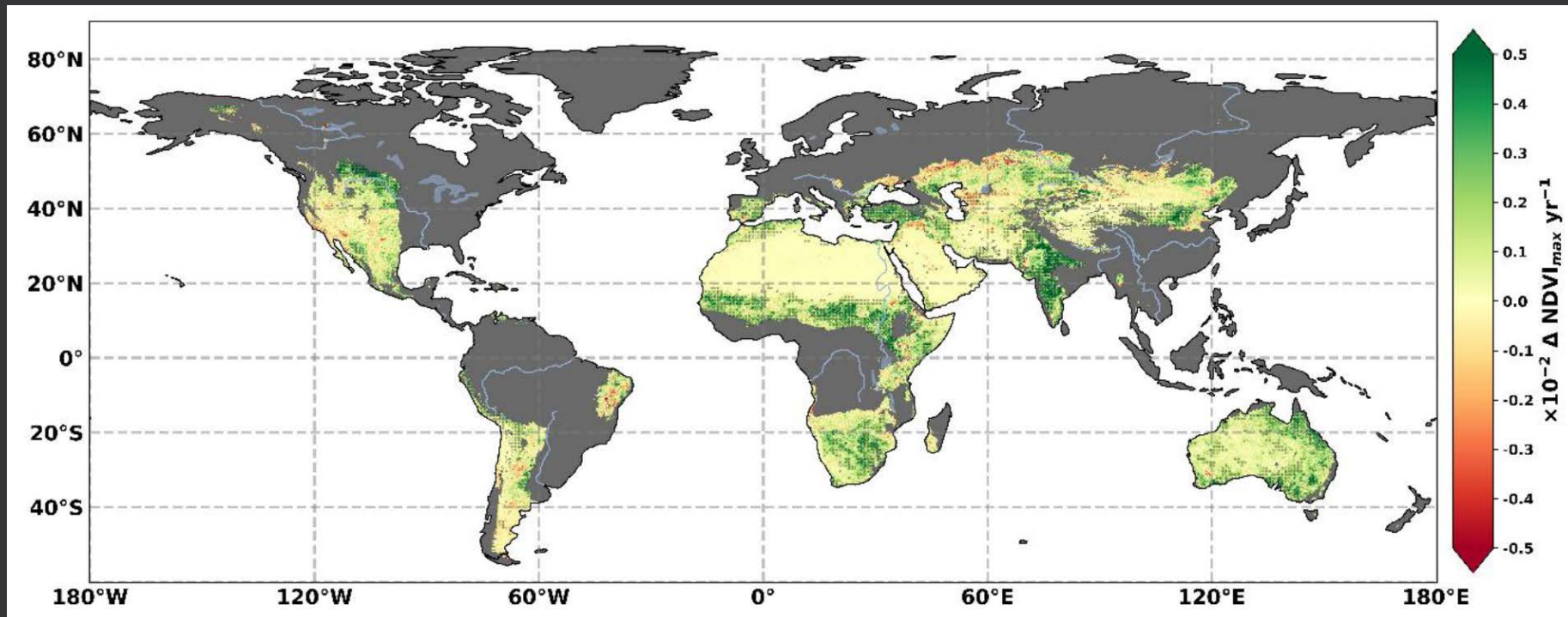


IPCC SRCCL, Ch3, Fig 3.9

Challenges

1. No one size fits all when it comes to quantifying land degradation / desertification at global scale

Vegetation; soil; nutrients; biodiversity; ecosystems; agriculture etc.



IPCC SRCCL Ch3, Fig 3.6 Trend in the Annual Maximum NDVI 1982-2015 (Global Inventory Modelling and Mapping 1 Studies NDVI3g v1)

Challenges

2. Hard (impossible?) to attribute causes (e.g. climate change) because of multiple interacting drivers of land degradation and desertification

Social, political, cultural, and economic factors. Land use; grazing; deforestation; climate; management; timescales



Prevention.web



Photo credit: Martin Harvey, Alamy stock photo

Challenges

3. Global problem that needs characterising and addressing at local scales

Sustainable land management; indigenous local knowledge; but...

Conflict as a driver of degradation:

Changes in land management; restriction of livestock mobility; displacement of people; political instability; lack of governance



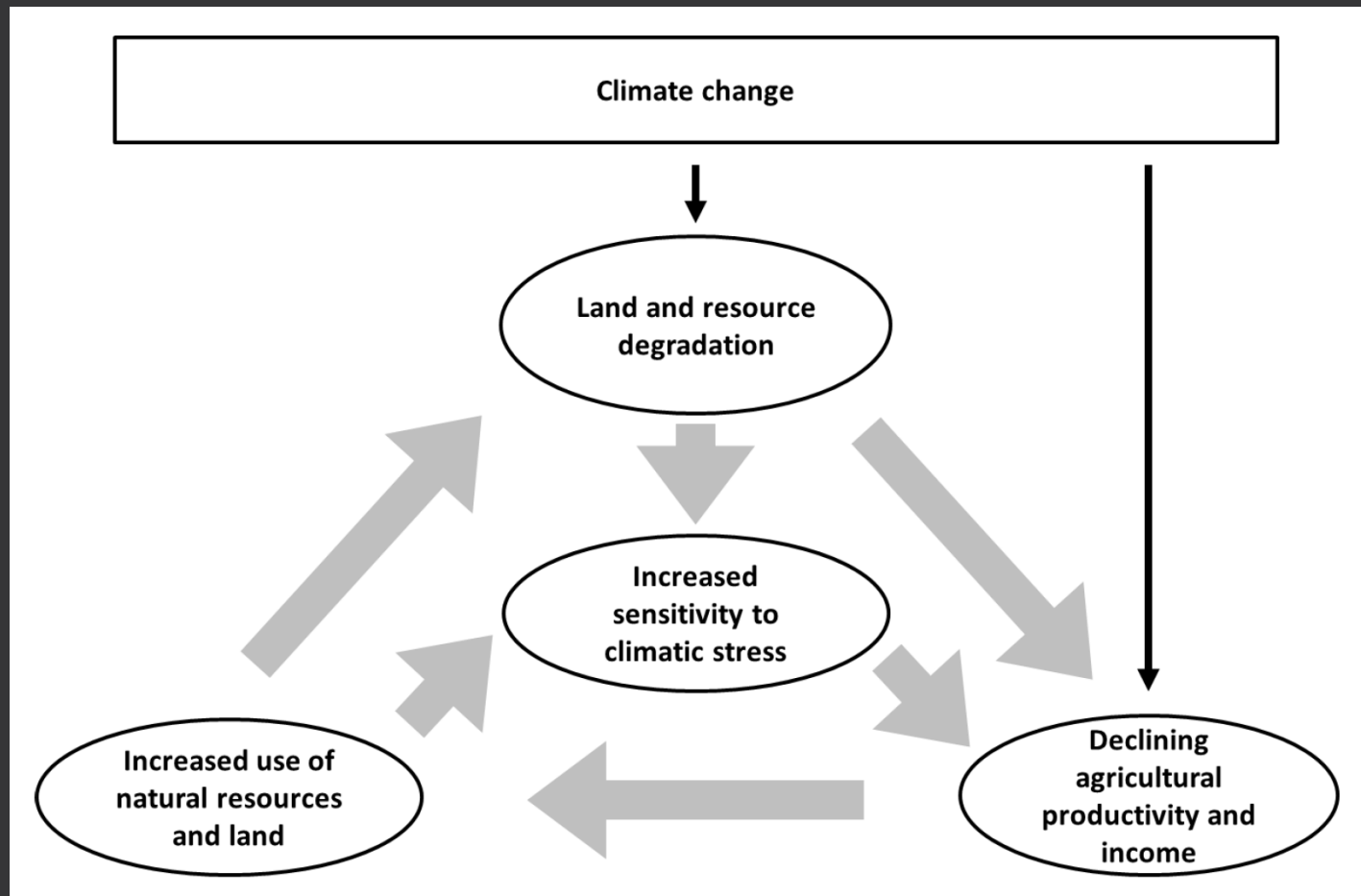
Image: Spioenkop.blogspot.co.uk

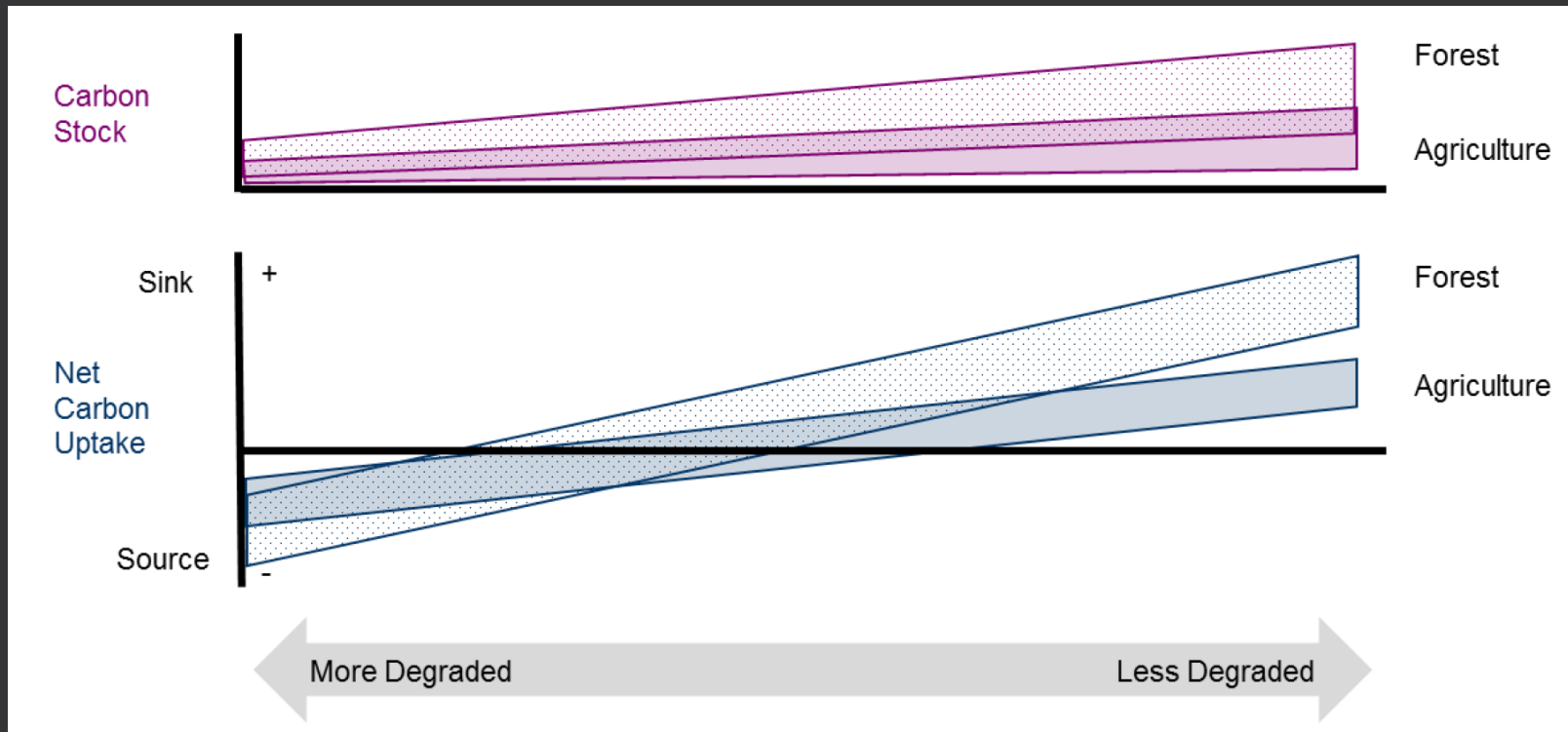
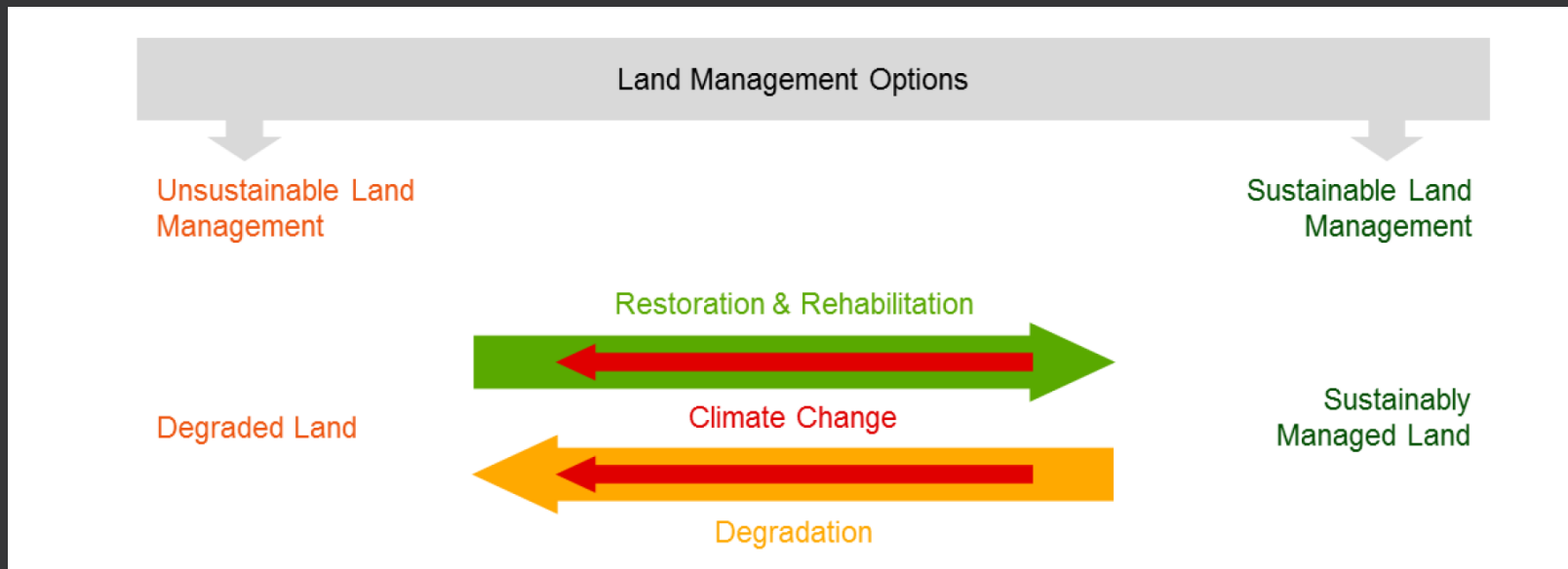


Images: UN environment, Somalia illegal charcoal deforestation



Key point from Ch3 and Ch4





IPCC SRCCL
Ch4, Fig 4.1

Thank you.



Photo credit: Katerina Michaelides