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Desertification: *a potential tipping point for soil and agriculture?*

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Desertification describes all forms of land degradation on drylands, it is associated with **encroaching of shrubs and woody plants on grassland** (1, 2)

- Almost half of the earth's land surface are non polar drylands
- Global estimations of the extant of desertification range from 15-50% of this area
- Drylands inhabit more then a third of the earths population (1)

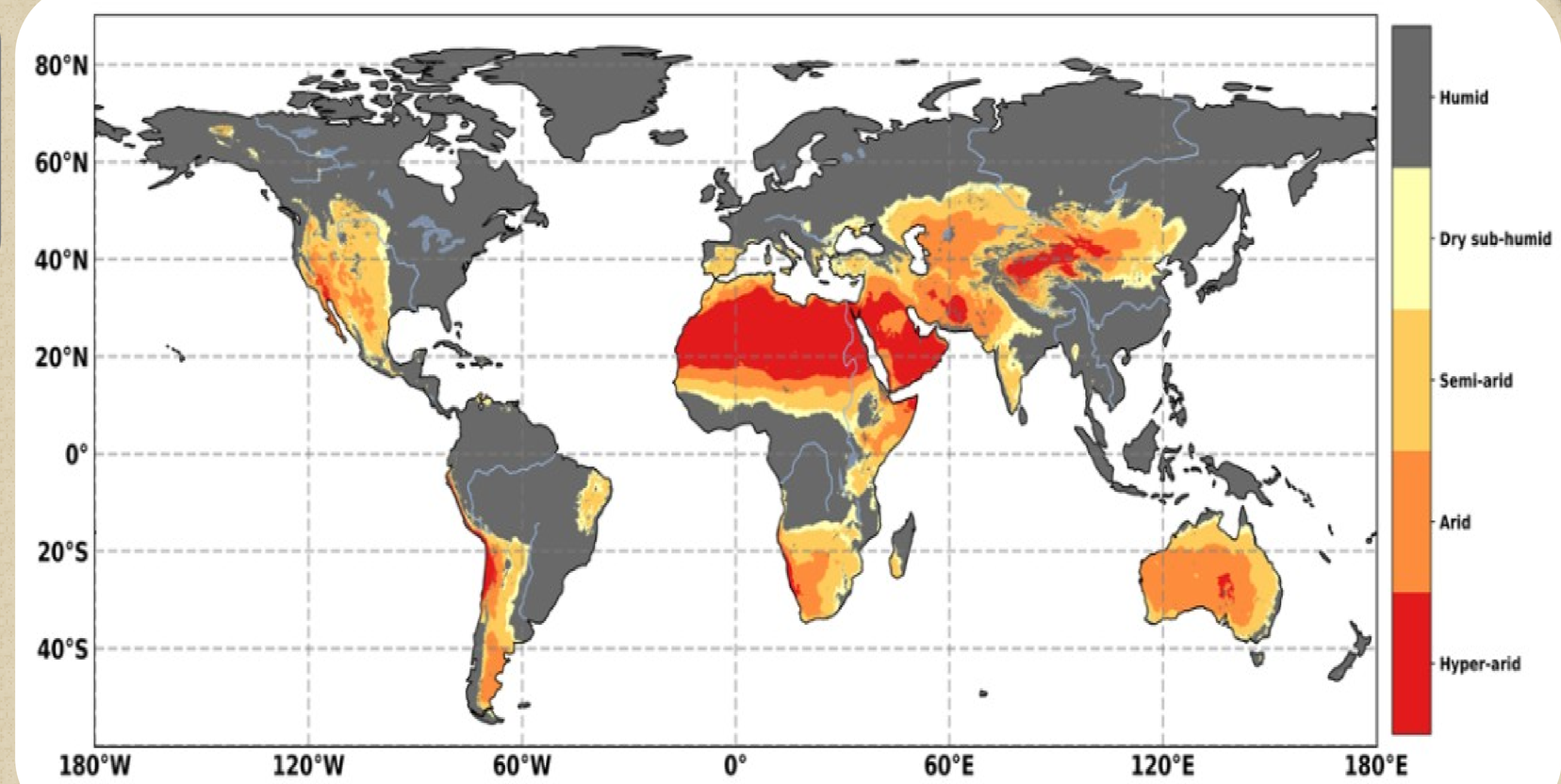


Fig. 1: Global extant of drylands (1)

Vegetation Regime Change

Drivers

Human Impact
- Overgrazing,
- Land conversion
- Agricultural
- Increasing CO_2

Climate Change
- Warming temperatures
- Draughts
- Changing precipitation
- Extreme events

Gradual or rapid shift from C_4 grassland to C_3 shrubland

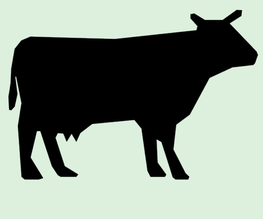
Effects
- Erosion
- Loss of soil organic carbon
- Increased water runoff
- Reduced water saving capability
- Salinisation

Feedback

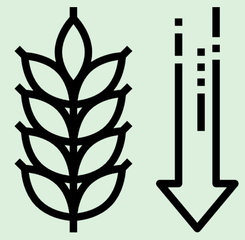
(1,2,3)

Impact on agriculture

Regarding the extent of affected dryland area worldwide and with more than 9 billion people to feed by 2050, the tipping of soil ecosystems due to desertification and climate change may put **our food security** in jeopardy.



- lower forage potential for livestock



- lower crop yield
- Cropland abandonment

- water scarcity
- wastewater effluents used for irrigation

- low value ecosystems for agriculture

(1,4)

The extent of desertification and its effects are still **poorly understood**. Complex feedback loops on climate and globally different pressures on drylands are hard to predict. Acquiring more data and funding for research is essential (1, 2, 4).

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