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# The vast potential of sustainable grazing

Next to forest, grassland is the largest biome on our planet, covering about 40 % of vegetated land surface. Of all agricultural land worldwide, one third is cropland and two thirds are grassland. Richard Conant from Colorado State University emphasizes in a Technical Report for the FAO the soil fertility of steppe grassland: "Good grassland management can potentially reverse historical soil carbon losses and sequester substantial amounts of carbon in soils." According to global estimates by the FAO, grassland soil stores 50 % more carbon than forest soil (Conant 2010; Dass et al 2018).

This is because grassland has a different growth dynamic compared to forests. Trees store most of the absorbed carbon in their own biomass, mostly in the wood above ground. What we see above ground is the result of many years and even centuries. Grasses, however, store most of the absorbed carbon not in their own biomass. Due to the co-evolution of million years, grasses need the bite as growing impulse (what we can imitate by mowing). What we see above ground is only the result of a few months of growth, at most. Grasses store most of the absorbed carbon in the soil as the dominating part of soil organic matter (humus). As 1 tonne of humus contains more than 50 percent carbon, it relieves the atmosphere of about 1,8 tonnes $CO_2$ (Idel 2020).[1]

Globally, grazing is as important for non-arable land as it is for the world's extremely fertile bread baskets: "Savanna, steppe, prairie, or pampas: They're all grasslands, the globe's most agriculturally useful habitats" (Nunez 2020).

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Discussing soil fertility, most scientists are not aware of the common origin of these areas: The extremely fertile (former) grass plains on our planet with black chernozem soils are steppes which developed through the co-evolution of grasses and grazing animals. Grazing induces a growing impulse in grasses. These possess huge amounts of fine roots and a root-shoot-ratio from 2-20 to 1. That's why the resulting carbon storage is mostly root-derived (Bakker et al. 2013). The roots of today are the soil organic matter of tomorrow.

The black soils of the North American prairies, the Ukraine grasslands, the Hungarian Puszta, the Baragan Steppe in Romania as well as those in Kazakhstan, Mongolia and China (Manchuria) or the subtropical Pampas in Argentina and Uruguay not only all have high fertility, but also have the same origin by grazing. A high share of mineral loess loam was a good precondition for the development of soil organic matter, but it became stimulated from above – through grazing.

Grassland provides the livelihood for one tenth of the world's population. The FAO estimates, that for 100 million people in dry regions and probably another 100 million people in other regions, grazing animals are the only available income source (FAO 2020). "Mobile pastoralists (…) may also offer one of the greatest hopes for mitigating climate change" (Davis and Nori 2008).

The ecological potential of grazing animals found little reflection in the IAASTD reports.

The IAASTD process recognised the world's mobile and semi-mobile pastoralists as important groups among indigenous societies – but mainly for socioeconomic reasons, because their grazing animals are key to satisfying their basic needs. Unfortunately, the ecological potential of pastoralists and their grazing animals has been and still is massively underrated and found little reflection in the IAASTD reports.

**There are three main reasons why the vast potential of grazing is often overlooked:**

**1.** Grazing is perceived as extremely negative where it is associated with **rainforest destruction** for industrialised beef production. While this is indeed an abuse of rainforests and the least fitting area for grazing, it would be a dangerous mistake to condemn grazing generally.

**2.** In the last decades **overgrazing** became dramatically widespread in different regions of the world for three reasons: increasing herd sizes, decreasing availability of land and politically warranted restriction of mobile grazing by incentivising nomadic people to settle. Starting during colonial times and later continued by means of developmental aid, millions of dollars were spent on wells as cattle dew points. As a result, herds remain in one location for much longer than the grassland can support (FAO 2020).

**3.** Cattle are perceived as climate killers because of their immanent burping of **methane** (ructus). But there is a huge difference between industrial livestock farming on the one hand and cattle grazing on carbon storing steppe soils and non-arable land on the other hand. Industrial livestock farming causes additional climate and other environmental impact through the feed production, which is often based on land use change – ploughing up grasslands and cutting down rainforests – and on pesticides and synthetic nitrogen fertilizer. This in turn releases nitrous oxide ($N_2O$) which has 300 times the climate impact of $CO_2$ – costs which are fully externalized (Idel and Reichert 2013).

Sustainable cattle grazing on permanent grassland does not compete with other uses and therefore does not happen at the expense of human food production.

Furthermore, it is key regarding groundwater regeneration – quantitatively because of grassland's large share in vegetative cover of soils worldwide and qualitatively because of its low(er) level of pollution with pesticides and synthetic fertilizer. An additional benefit of sustainable grazing is hidden in the excrements: One cattle of about 500 kg is producing some 10 tonnes of dung per year, which in turn supports the biomass of more than 100 tonnes of insects per year – fodder needed for biological food chains and biodiversity (Idel 2020).

### Endnote

1 Carbon has a molecular weight of 12g/mol, while $CO_2$ has a molecular weight of 44g/mol (due to the addition of two oxygen molecules). Hence 1 kg of carbon, if oxidized, will release 3.67 kg of $CO_2$.

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