
What explain the strong resilience of herbaceous vegetation to grazing in the Sahel?

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Résumé

Sahelian rangelands provide most of the fodder grazed by livestock, first source of income of rural population. However grazing, together with droughts, is commonly accused to degrade vegetation, leading to desertification. Yet, monitoring rangeland sites in Mali, Niger and Senegal over several decades, including under AMMA-CATCH, confirmed the large sensitivity of the herbaceous production and species composition to rainfall vagaries. By comparing sites under contrasted grazing pressure, it revealed strong resilience to grazing unlike other arid ecosystems. Remote sensing found overall greening since early 1980's (Dardel et al 2014) while livestock population increased steadily.

The main reason of resilience could be that the herbaceous vegetation is almost exclusively composed of short cycle annuals fitting the monomodal distribution of monsoon rainfall (Hiernaux Le Houérou, 2006). Herbaceous growth monitoring every 2 weeks indicated that at least 80% of the herbaceous production was achieved in 3 weeks (Hiernaux et al. 2015). This is very short time for livestock grazing year round to impact growth all the more than they are mobile and grazing behavior optimizes feed quality selection (Assouma et al. 2018). Moreover, grazing in the dry season limits livestock intake to a third, at most, of the herbaceous mass at the onset of the dry season (Diawara et al. 2018). Indeed livestock by trampling are transferring straws to litter and litter to the soil organic matter. Moreover livestock are returning to soil about half of the organic matter intake as feces, and larger fractions of minerals through feces and urine excretions (Hiernaux et al. 2014). Finally the impact of grazing and trampling on the transient soil seed stock is multidirectional depending on plant species but globally minor. The resilience only holds as far as the livestock system is pastoral and seasonally mobile adjusting grazing pressure to fodder availability. The settling and intensification based on feed inputs could question the resilience.

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Mots-Clés: Resilience, livestock grazing, pastoral, sahel, desertification