37.   Climate Smart livestock development in natural and improved savannas of an extensive ranch in central Africa (RDC)

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In the Central African extensive livestock systems improved management practices and technologies can deliver a significant portion of the Climate smart efforts needed (FAO 2014). The "Kolo" ranch is located 14°45' - 15°00' E, 5°15'- 5°52' S (Bas-Congo, DRC). 20 000 N'dama cattle heads are managed for a production of 1200 tons live weight (LW) on 50 000 ha: 47 500 ha of natural "Hyparhenia" savanna (NS) and 2 500 ha of Brachiaria improved grasslands (BiG). Farm gate LCA methodology and IPCC references were contextualized to the local practices to estimate the level and diversity of non-renewable energy (NRE), GHG emissions and economic efficiencies of the system. The results show an overall NRE consumption of 6 259 MJ t LW^{-1} $year^{-1}$. The system based on abundant pasture resources and fire use to stimulate regrowth in NS, using very few inputs and light infrastructures, is low consumer of energy. GHG emissions are important: 30 t CO_2-e t LW^{-1} exported, biomass burning and enteric emissions shares are 50% and 36% respectively of the emissions. On the ecologically intensified surfaces (BiG) of the ranch, where fire use is strictly avoided and where the finishing animals are concentrated, performances are increased due to biomass and forage quality improvement, the carrying capacity is raised from averages of 0,41 on (NS) to 4,51 TLU / ha on (BIG). The annual LW gain per ha is in proportion 12 vs 254 kg ha^{-1}. Related to meat production, we observe a lower energy consumption 7 978 and 4 405 MJ/ton LW Gain and GHG is reduced 51,7 and 8,5 t CO_2-e t of LW Gain on average NS and BIG surfaces respectively. The production costs are 2,14 and 1,23 €/Kg carcass eq. LW gain for NS and BIG surfaces respectively. In such tropical environments and livestock systems, grassland improvement and changes of management practices are very probably the most effective Climate smart investments to mitigate climate impact contribution and improve environmental and livelihoods efficiencies.