Session 1.8 Livestock and Grasslands

17. *Poster Presentation*

Title: **Modeling Climate Change Impacts On Livestock Productivity In Semi-Arid Zimbabwe**

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Abstract: In semi-arid Zimbabwe livestock play a vital role in the livelihoods of small-scale farmers. Current productivity is low due to various inefficiencies, but there is a huge potential for farmers to obtain significant incomes from strategic sales and improved management. Climate variability and change are a threat, especially through negative impacts on the major fodder sources, such as rangelands and crop residues. This study used the LivSim model to simulate the impacts of climate variability and change on livestock productivity by taking into account the effects on the feed base. Model calibration was done based on local breed data from farms and experiments. The feed inputs consisted of grass from rangelands and crop residues from maize, sorghum and groundnut, obtained from crop modelling using Apsim and DSSAT. Different climate scenarios were created using two contrasting GCMs. Milk yield, offtake and mortality rates were simulated for a 30-year period for 160 households. The study also assessed the benefits of adaptation by including a forage legume (Mucuna pruriens) in rotation with maize, in addition to micro-dosing fertilizer on maize. The results indicated that in the hot and dry climate scenario, crop residue and rangeland production declined, leading to reduced livestock productivity. The adaptation package can mitigate the negative impacts of climate change on milk production, offtake and mortality. Farmers can thus reduce their vulnerability to climate change by increasing feed quantity and quality. Improved market access becomes essential for farmers to benefit from improved offtake and continued investment in adaptation packages.

18. *Poster Presentation*

Title: **Parameterizing LivSim for simulating growth of the Ghana shorthorn cattle**

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Abstract: An important component of the farming system in Ghana is livestock production. Livestock, especially cattle production is heavily dependent on rainfall for the production of forages to feed them. Projected increase in temperature and shifts in rainfall patterns due to climate change is expected to affect the level of livestock production and livelihood of the resource poor animal herders in Ghana. To gain insight into the livestock-climate nexus, we conducted a study in Tamale in the Northern region of Ghana to parameterize the LivSim (Livestock Simulator) model for the simulation of growth of the Ghana Shorthorn cattle. The main objective was to quantify milk and calf production by the various smallholder farmers in the community. A survey of 261 households out of which 96 owned livestock was conducted to obtain observed data on milk yield, calving frequencies, among others. Other data required by LivSIM such as the minimum and maximum bodyweights of both male and female Ghana Shorthorn were obtained from the literature. The number of cattle owned by the households interviewed ranged from 2-47 with majority having a herd size less than twelve. The herd composition was estimated to be 72% female and 28% male. Preliminary simulation results showed that the herd dynamics could be well captured for an initial period of 5 years, after which there was divergence between the simulated and the observed. Further current efforts are directed to the improvement in parameter values especially those relating to the potential growth rates and the compensatory growth rate.