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Assessing the Sustainability of Different Livestock Production Systems of Small Farm Holders in Amibara District, Afar Region, Ethiopia.

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ABSTRACT

Group discussions as well as semi structured questionnaires were used to characterize the agropastoral, pastoral and landless intensive small scale livestock production systems. Quantitative and qualitative data were collected on feed and livestock resources, production technology, livestock products, product use and land tenure. Operational indicators were identified and data collected to assess the sustainability of these respective production systems in terms of the ecological, economic and social dimensions. Out of 82 interviewees in Amibara district, 93% claimed that private land ownership was the best land tenure incentive for efficient rangeland management. The environmental sustainability indicators identified were water availability, forage availability, biodiversity conservation and health impact from chemical pesticide use. Economic indicators included farm productivity, input self-sufficiency, savings and investments while social indicators included gender equality in participation and decision making within the household, equality in income and food distribution and land tenure type whose measurement process was defined in the methodology. A score for each sustainability indicator was developed and ranked from the lowest to the highest and categorized into three classes of "non-sustainable" (N=0-30%) to "conditionally sustainable" (C=30-60%) and "sustainable" (S=60-90%) as adopted from FAO (1976). Agropastoralism was the most sustainable livestock production system with a score of 62% while pastoralism and the landless intensive small scale systems were conditionally sustainable at 56% and 58% respectively. Prosopis juliflora expansion, sporadic rainfall, draught, disease infestation, feed shortages and grazing species extinction were the significant causes of decreasing productivity in all our systems. Investment income, agricultural loans and subsidies were almost completely absent. Agricultural inputs were over 80% local and accounted for input self-sufficiency. Landless intensive small scale farmers (LIs) had the highest equality in income distribution at GI=0.40, followed by agro-pastoralist (APs) with GI=0.48 while pastoralist (Ps) had the highest income inequality with GI=0.49. An average of three meals/person/day were consumed, which was regarded sustainable but nutritious content and calory intake was not measured. Gender equality was poor for all systems and the relationship between educational background and perceived requirement for farm system sustainability as well as the relationship between farm income and grazing species conservation did not differ across the systems as the statistical difference within each system was insignificant. Our results suggest that different farming systems had specific indicators which demonstrated very poor performance. The scores obtained only represent estimated levels of sustainability which could help agricultural policy makers understand which kind of interventions are most needed as well as how trends are changing over time. Specific indicators under different systems demonstrated very poor performance thereby calling for specific interventions within the different systems.