Tropentag, September 18-21, 2016, Vienna, Austria

"Solidarity in a competing world — fair use of resources"

Potential Impacts of Increased Napier Cultivation in Lushoto, Tanzania

Birthe Paul[1], Stijn Heemskerk[2], Julius Bwire[3], Beatus Nzogela[1], Pablo Tittonell[4], Jeroen C.J. Groot[2]

[1] *International Center for Tropical Agriculture (CIAT), Tropical Forages Program, Kenya*
[2] *Wageningen University (WUR), Farming Systems Ecology, The Netherlands*
[3] *Tanzania Livestock Research Institute (TALIRI), Tanzania*
[4] *National Institute for Agricultural Technology (INTA), Natural Resources and Environment Program, Argentina*

Abstract

In Tanzania, 21.3 million cattle (1 million crossbred dairy, 10.3 East African Zebu) are reared by estimated 1.7 million smallholder farmers, with Tanga being one of the most important dairy production regions. Inadequate feed resource base and low quality of natural pastures are among the main reasons for poor livestock productivity. Forage technologies have been promoted in Tanzania for sustainable intensification of crop-livestock systems, but there is a lack of research that quantifies the potential impacts and trade-offs of these technologies on livelihoods of smallholder farmers.

Therefore, a study was initiated in Lushoto district in Tanga region. Household surveys, feed and milk analyses, and geo-referenced soil sampling were conducted at 20 farms participating in an Innovation Platform to improve livestock productivity in Ubiri village. A participatory scenario development workshop was conducted to identify the preferred livestock feeding strategy. Livestock, crop and whole-farm simulation models were then linked to compare bio-economic performance, trade-offs and synergies of business as usual to the forage intensification scenario.

Currently, farmers were found to feed only half of the quantity that is required for crossbred cows, resulting in low average milk production per animal of 4.8 L day^{-1}. An average 31 % of all on-farm labour is used for livestock feeding, especially for cutting from far-away natural pastures. Total income including own farm production was low with an average of 772 USD year^{-1}. Increased Napier grass (*Pennisetum purpureum*) cultivation on homestead plots for cut-and-carry was identified as the preferred livestock feeding intensification strategy, together with maize bran supplementation. The scenario shows potential for substantial improvement compared to the baseline in terms of milk production, net cash income and labour demands. However, attention needs to be paid to soil fertility and risk of nutrient mining when substituting forage collection from public (wet)lands with on-farm forage cultivation as less nutrients are imported to the farm. Also, long establishment time of Napier grass in the Lushoto mountainous climate would diminish potential returns in the first year.

Keywords: Bio-economic modelling, *ex-ante* impact assessment, farming systems

Contact Address: Birthe Paul, International Center for Tropical Agriculture (CIAT), Tropical Forages Program, Nairobi, Kenya, e-mail: b.paul@cgiar.org