



Tropentag, September 19-21, 2012, Göttingen -
Kassel/Witzenhausen

“Resilience of agricultural systems against crises”

Mixed-Farming in South Asian An Era of Resilient Agricultural Systems

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Abstract

Two-thirds of the rural poor in South Asia still depend on mixed crop-livestock systems for their livelihoods despite a trend towards more specialised farming. In this region the main links between cropping and livestock are crop residues as feed and dung as farm yard manure. At the same time crop residues can be incorporated into the soil directly to improve fertility, vital to improving the sustainability of intensifying cropping systems. While mechanisation has reduced the number of draft animals, the growing demand for milk and meat and reduced grazing opportunities have increased the demand for cereal residues as feed.

In this regard, the present study seeks to improve the understanding of current crop-livestock interactions, mainly in regard to the use of crop residues, in mixed systems with different levels of agricultural intensification and agro-ecological conditions. Surveys were conducted among 480 households in three study sites: two from India (Karnal and Udaipur) and one from Bangladesh (Dinajpur) across the Indo-Gangetic plains from January to April, 2011. The results indicate that the use of crop-residues varies across crops, regions, market integration and also harvesting method (*i.e.* manual or combined). The main residue used for stall feeding in Dinajpur is rice straw while in Karnal it is wheat straw and in Udaipur farmers mainly feed maize stover. Where crops are harvested by combine harvester (in high intensity areas such as Karnal) more than 50% residue is left in the field while more than 70% of residues are used as feed when crops are harvested manually. Regression analysis of crop residue use shows that landholding size does not determine the share of residues used for mulching or feeding. However, herd size has positive impact on the relative extent of feeding of crop-residues. The findings on dung use indicate that a higher proportion of dung is used as manure in less intensified areas (Udaipur) compared to highly intensified systems with good access to inputs as in Karnal. Nevertheless, the threat to system sustainability appears to be highest in Udaipur overall demand for off-field residue use is greatest within the three study sites.

Keywords: Crop residue, feeding, manure, mixed-farming, soil fertility