

Policy Briefing

Synergies for improving beef and maize value chains in Uganda



The AgriTT programme is an innovative trilateral initiative between the UK Department for International Development (DFID), the Chinese Government, the Governments of Malawi and Uganda and the Forum for Agricultural Research in Africa (FARA). The programme facilitates the sharing of successful experiences in agricultural development with developing countries to improve agricultural productivity and food security.

The AgriTT Research Challenge Fund supported two year research projects to generate new thinking and practice on technology transfer and value chain development. Each project had a Chinese, UK, and African or South-East Asian research partner.

Learning from China's impressive growth in both sectors

Maize is a major crop in both Uganda and China. It is the most important cereal crop in Uganda, being both a staple food and a major export product. In China, maize has recently overtaken wheat and even rice to become the major crop – largely due to increased demand for livestock feed. Following a substantial fall in cattle production in China between 2005 and 2013, a National Development Plan for Beef and Mutton Production aims to increase beef output by around 40% by 2020. This rapid development of the Chinese beef cattle industry has led to improvements in related areas such as butchery and beef processing, and has promoted the restructuring of the country's meat production. In Uganda the situation is very different: smallholder farmers own about 90% of all cattle, the majority under pastoral and agropastoral production systems in the rangelands, with limited participation in livestock markets.

This project aimed to analyse and contrast the cattle and maize value chains in both countries, to identify key transferrable technologies, and to draw out lessons to guide future development strategies and policies. The study reviewed agricultural productivity, market participation and value chain development, and identified the factors linked with higher productivity. Nineteen researchers surveyed stakeholders working at different points of the value chains in Inner Mongolia and Shandong, China; while researchers from Makerere University and MAAIF led surveys covering the three main regions of cattle and maize production in Uganda. Data from nearly 1,000 interviews were then analysed.

Comparative outputs indicate the great potential for Ugandan beef and maize production, market participation, and future development of the two sectors (Table 1).

Table 1 Comparing the beef and maize value chains – project survey results for Uganda and China

	Uganda	China
Beef		
Weight of beef cattle at sale (kg)	129	325
Age of beef cattle at sale (days)	390	321
Average daily gain of beef cattle (g per day)	332	1045
Maize		
Average maize yield (tonnes per ha)	1.8	12.3
Average maize productivity (kg per working day)	11	170
Chemical fertiliser application (kg per ha)	21	1427
Market participation ratio (sale to production) (%)	18	90
Profit (US\$ per ha)	117	2308



Agricultural
Technology
Transfer

By bridging the yield gap and the labour productivity gap, smallholders in Uganda could increase their market participation and their income significantly, and this research has highlighted some key approaches.

The poor performance in the Ugandan maize sector is a result of the low-input/low-output system. Application of chemical fertiliser is minimal in Uganda (Table 1), and the story is the same for pesticides, machinery and irrigation. Most maize seed in Uganda is saved from previous seasons, whereas Chinese farmers do not use saved seed.

Several Chinese technologies benefiting from the joint production of maize and beef cattle could be transferred to Uganda. One is ammonification of maize crop residues for cattle feed. Cereal straws generally are low in protein, high in lignin and low in available energy content, whereas urea-treated straw shows an increase in nitrogen content and digestibility. The technology, which has been promoted by FAO's China-Uganda South-South Cooperation (SSC), requires just a simple ammonification pool sealed with plastic.

Also, Chinese methods of using green maize silage, little used in Uganda, have the potential for transfer. The use of feedlots can control the genetics, health and feeding regimes of cattle. Value can be added by buying calves from pasture and fattening them in the cropping area. And especially in light of the low inorganic fertiliser inputs in Uganda, more use could be made of excrement from cattle as an organic fertiliser for maize.

Government support for agricultural markets and infrastructure makes a real difference. In Uganda there is little reliable market information, which is provided mostly by middlemen and traders. In China, market conditions are much better, with strong government support for market prices, market information and regulation. The Chinese Ministry of Agriculture's Agricultural Market Information System (AMIS) has been rapidly developed and upgraded in recent years, monitoring 18 agricultural commodities including beef/mutton and maize. In addition, participation in maize crop insurance is very popular in China, with strong government subsidies; in contrast, there is almost no access to crop insurance programmes in Uganda.

Policy recommendations

- **Public-private partnerships should be supported throughout the beef and maize value chains.** This could be promoted through government facilitation of a steering group that encourages the various players without stifling private sector activity. The components for building more efficient value chains already exist in Uganda and there is substantial interest from the private sector. The biggest meat processor in Kampala (Fresh Cuts) is ready to work with improved maize/pasture producers, new feedlots, cooperatives and farmers to deliver better quality products. And, for example, there may be opportunities for investment or technology transfer through the Sino-Uganda Agricultural Industrial Park, currently under construction in Luwero District in Uganda's Central Region.
- **Growing incomes are leading to increased consumer demand for value-added beef products in Uganda, Tanzania, Kenya** and elsewhere in sub-Saharan Africa, offering farmers opportunities for premiums and more revenue. More efficient maize production is not in itself a value-added proposition for small farmers, but is necessary for beef production. Uganda could benefit from the growing global demand for beef, but only if Uganda's beef industry is well structured from production to processing, and tailored to produce appropriate quantity targets, especially with increased yields through improved breeds and breeding practices.
- **There is potential for better synergies between cattle farming and maize production.** The common practices in China of using green maize silage and ammonification of maize straw to feed cattle, and using cattle excrement as fertiliser on maize, are little practised in Uganda and show potential for transfer.



The ingredients for building more efficient cattle and beef production are there in Uganda, and with the right leadership an improved and more effective value chain could be kickstarted at very little cost



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