False beliefs on the socio-economic drivers of cassava cropping

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Abstract – General belief has it that cassava is (i) a subsistence crop, grown to avoid hunger (ii) by poor farmers, (iii) predominantly as an intercrop, (iv) requiring less labour than other crops and (v) no inputs. These beliefs influence policy, project development and implementation, and if wrong, may have far-reaching consequences for the success and sustainability of interventions. This study examines five beliefs about cassava and discusses consequences for interventions targeting cassava. From 2004 to 2006, 120 detailed farm surveys were carried out with smallholder farmers in 6 sites in central/eastern Uganda and western Kenya, whereby households were categorised in three wealth categories by local key informants. Through structured interviews and field visits, details on the importance of cassava, socio-economic indicators, food security, crop management and labour aspects were obtained. Our results show that cassava does ensure food security, but that the other beliefs are either myths or half truths. Besides supplying 27–41% of starchy staple food consumption, cassava also provided significant income (84 US$ yr−1), similar to that of maize (90 US$ yr−1). It is too simplistic to classify cassava as a ‘poor man’s crop’ as in Uganda wealthier households marketed more (+16%), but in Kenya consumed less (−11%) cassava than poorer farmers. Cassava is not predominantly intercropped (30% of acreage in Uganda and 51% in Kenya), farmers do use inputs on cassava (36% of the households hire labour) and total labour requirements (287 mandays ha−1) were higher than for most crops. Contrary to expectations, we conclude that increasing cassava production will not improve food security – unless a disease epidemic is present – but instead will improve the scope for commercialisation of cassava. To ensure that projects designed to enhance cassava production benefit poor and/or labour deficit households, specific provisions are needed, including development of labour saving technologies.

1. INTRODUCTION

Since its introduction in Africa in the 16th century, cassava (Manihot esculenta Crantz) has become one of the most important crops on the continent. Production has more than tripled in the last four decades (Hillocks, 2002) and the crop is currently grown on approximately 12 million hectares. As food, feed and industrial markets are promising (FAO, 2004), there is an increasing focus on cassava by governments, research and development institutes in Africa.

Over the centuries, many beliefs have evolved concerning the role of cassava in sub-Saharan Africa. Cassava is said to be a subsistence crop, grown to avoid hunger (Hillocks, 2002; Gatsby, 2004) by resource poor, small farmers (Jameson, 1970; Alves, 2002; FAO, 2004) who plant it preferably as an intercrop to reduce the risk of crop failure, while maximizing returns to land and labour (Otím-Nape et al., 1997; Leihner, 2002). Further, cassava is thought to require less labour than other crops (Cock, 1985; Berry, 1993) and to be grown without inputs (Leihner, 2002). Such beliefs will influence policy and project development and implementation, and if wrong, may have far-reaching consequences for the success and sustainability of interventions.

Few studies provide solid data to verify these beliefs on the role of cassava. The Collaborative Study of Cassava in Africa (COSCA) reported the most comprehensive information on cassava based cropping systems, but labour use and crop management issues are poorly described and the socio-economic role of cassava has not been investigated. Few other studies are available to confirm findings of the COSCA studies and these are from West and Central Africa (Fresco, 1986; Philips et al., 2006) with none from East Africa.
The objectives of this study were to investigate to what extent common beliefs about cassava are valid in East Africa and to evaluate consequences for the design and implementation of cassava policies and projects. We carried out a series of detailed farm surveys among smallholder farmers to evaluate the socio-economic role of cassava, crop management and labour use in relation to other crops. The selected study sites are representative for large parts of the cassava area in the mid altitude zone of East Africa as they exhibit a wide range in agro-ecological and socio-economic conditions. With average fresh yields of 10.6 t ha$^{-1}$ in Kenya and 12.0 t ha$^{-1}$ in Uganda, cassava yields are just above the African average of 9.9 t ha$^{-1}$.

2. MATERIALS AND METHODS

2.1. Site selection

This study focused on smallholder farming systems in central and eastern Uganda and western Kenya. Site selection was based on the importance of cassava, the degree of poverty, population density and agro-ecological characteristics (Thornton et al., 2002; Fermont et al., 2008). The farm surveys were carried out in three sites in western Kenya and three sites in Uganda. In Kenya, the sites included Kwang’amor (0°27’N; 34°18’E) and Ugunja (0°5’N; 34°18’E) in Teso, Busia and Siaya districts, respectively. In Uganda, the sites included Kisiro (0°67’N; 33°80’E), Kikooba (1°40’N; 32°38’E) and Chelekura (1°14’N; 33°62’E) in Iganga, Nakasongola and Pallisa district, respectively. Altitude in these sites varies between 1100 to 1260 masl, while the topography ranges from gently undulating to undulating. The climate in all sites is sub-humid with a bimodal rainfall distribution. In central Uganda less than 40% of the households falls below the poverty line, while parts of western Kenya have the highest poverty rates (>60%) in East Africa (Thornton et al., 2002). High population pressure in most sites (160–387 persons km$^{-2}$) has resulted in continuous farming systems with limited fallow (Fermont et al., 2008).

2.2. Farm selection and characterization

Households at the six farm survey sites were categorised by local key informants according to their resource endowment into three wealth classes: poorer, medium and wealthier. Criteria used for the categorization were site-specific and included farm size, number of animals, off-farm income and education of children. Within each site twenty households were randomly selected with a minimum representation of three households per wealth category. Structured interviews in combination with a visit to all fields within each farm were used to characterise each household in detail in terms of land use, socio-economic importance of crops, food self-sufficiency, crop management and labour aspects. Household income was calculated from income generated by crop activities, other farm activities (livestock, honey, hiring land), casual work, permanent income sources (salary or pension), business and remittances or ‘money sent home’. Interviews were held with the family member taking most of the decisions on farming activities, but information was cross-checked with other family members. Information was triangulated through multiple questions on sensitive topics, combining interview and field data, confirmation by key informants and subsequent visits. Income data were used to cross check the wealth class of the households, whereby 2 households were reclassified. The farm characterizations were carried out from June to September 2004 in western Kenya and from October 2005 to April 2006 in Uganda.

2.3. Labour use, food self-sufficiency and gross margin analysis

Available labour per farm was calculated from the number of family members in different age categories, assuming that children between 8–12 and 12–16 years contributed 0.15 and 0.45 man years, respectively and an adult person year was comprised of 312 working days (information from resource persons). Available family labour was corrected for labour hired in and hired out. To compare total labour requirements of cassava with other crops, farmers ranked total labour required for one crop cycle of cassava versus total labour required for one crop cycle of selected other sole crops on a same size field. Relative monthly labour requirement was calculated using the average harvest age of cassava as supplied by farmers and a crop cycle of 4, 5.5, 4, 4, 3, 8, 5 and 18 months for maize, millet, sorghum, groundnut, beans, sweet potato, cotton and sugarcane respectively. To evaluate the contribution of cassava to staple food consumption, all households ranked the relative importance of cassava and other starchy staple crops. To quantify food self-sufficiency, households indicated the number of months per year their farm supplied sufficient food.

For each farmer who supplied yield estimates for cassava and maize, partial gross margins for cassava and maize production were calculated. Costs taken into account were labour for ploughing, planting and weeding and purchase of maize seeds and fertilizer. Prices for hired labour were used to mirror the opportunity costs of labour (CIMMYT, 1988) as farmers hired labour for agricultural activities in the study areas. Labour costs did not vary significantly between sites within a country and average values per country were used. The number of weed operations and quantity of fertilizer used were obtained from the farm surveys, whereas constant values were used for ploughing and maize seeds. Harvest and post-harvest labour costs expressed per ton of maize or cassava harvested were measured in Uganda and took into account labour for harvesting, transport, peeling, chipping and drying. Average retail and wholesale market prices during the survey periods were used for maize seeds and fertilizer, cassava chips (250 Uganda Shillings kg$^{-1}$; Ugsh and 15 Kenya Shillings kg$^{-1}$; Ksh) and maize (290 Ugsh Kg$^{-1}$ and 17 Ksh kg$^{-1}$), respectively (1 US$ = 1818 Ugsh or 80 Ksh).