



## Beer multinationals supporting Africa's development?

### How partnerships include smallholders into sorghum-beer supply chains

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#### Introduction

Restrictions on the import of barley malt by the Nigerian government in the 1980s have facilitated an import substitution strategy that is now widely adopted by the African brewing industry. Barley malt is a key resource for beer brewing. Due to the Nigerian import ban, it was discovered that locally produced sorghum could serve as an adequate substitute for barley (Ogun, 1995). At present, all major brewers on the African continent partially substitute imported barley by sorghum and other locally produced crops, because they are cheaper and do not entail currency losses (Lapper, 2010; Wiggins, 2008). The African informal market of artisanal beers, wines and other drinks made from local ingredients, such as sorghum, is estimated to be four times bigger than the formal sector, and has a value of about US\$ 3 billion. Heineken, Guinness and SABMiller now compete with this African home brew market (Capell, 2009).

The shift to local resources serves as an incentive for the development of local supply chains that could stimulate agricultural production in Africa. However, such chains are not easily created. In Sub-Saharan Africa, the sorghum grain (*Sorghum bicolor*) is grown in unpredictable 'rain-fed' agriculture contexts, while farmers cannot afford the use of additional inputs. With 300 kg/ha the productivity of African sorghum farming is far below yields in other regions of the world that may reach 9000 kg/ha (ICRISAT,

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2008). In 2001, Guinness Ghana tried to set up a sorghum supply chain in Northern Ghana, but failed completely. The company had facilitated farmers in acquiring fertilizer, agrochemicals, as well as certified seeds of a new sorghum variety *Kapaala*, but had to reject most of the grain one year later because of low quality (Kudadje 2006). The harsh climate and limitations in the institutional business environment hindered the African farmers to integrate into a modern value chain.

Considering the challenges of setting up robust sorghum supply chains for industrial brewing, multinational brewers have sought collaboration with non-governmental organizations (NGOs) and government agencies. In several African countries, partnerships have been established to advance the institutional changes required for the production of high quality sorghum.

Partnerships can be defined as voluntary, collaborative arrangements between actors from the different societal domains - the state, market, and civil society-, which have an institutionalized, yet non-hierarchical structure and strive for a sustainability goal (Glasbergen *et al.*, 2007). Such collaborative arrangements between private and public actors are increasingly popular to overcome market or government failures, because partners can pool their resources, knowledge and capabilities (Kolk *et al.*, 2008), and because they can offer partners advantages in terms of increased flexibility, productivity, cost reduction and innovations (Jenkins, 2007). Private companies can also gain local market knowledge in emerging economies. Cooperation with governments and civil society organizations abroad partially offset the risks that are inherent to operating in new developing country markets (Muller and van Tulder, 2006).

Partnerships can promote pro-poor economic development when they address institutional barriers that hinder the inclusion of smallholders into (global) supply or value chains. The aim is a win-win scenario: the partnerships serve firms in establishing a cost-reducing and robust supply chain while they offer farmers a new market opportunity embedded in an improved business environment that may result in additional income generation. However, some authors have pointed out that success of this strategy is all but guaranteed. Development partnerships may be a mechanism for “institutional capture”, whereby corporate interests come to dominate or heavily influence the decision-making process of public-private institutions (Utting, 2000). They may also distract attention away from asset development which is just as important as income growth when fighting poverty (Boyle and Boguslaw,

2007). The discussion of whether or not value chain partnerships are benefitting both farms and firms is still ongoing because empirical evidence on this issue is lacking (Rein *et al.*, 2005).

The aim of this chapter is to address this knowledge gap by exploring ways to assess partnership interventions intended to include smallholders in commercial value chains. The focus is on the partnership's ability to induce changes in the institutional environment. We analyze five partnerships for the development of sorghum-based beer value chains in four African countries: Sierra Leone, Ghana, Uganda and Zambia. The cross-case analysis tackles two questions: (a) To what extent have the partnerships succeeded in making the institutional business environment of value chains more conducive to smallholders; and (b) To what extent have smallholders actually benefitted from those changes, judged from the actual upgrading in sorghum production?

The chapter is structured as follows. The first section offers a brief overview of institutional challenges to small-scale farming. The methodology section describes the five case studies and the ways data was collected and analyzed. The third section provides the analysis and is followed by a discussion of the most significant findings.

### **Partnerships addressing institutional barriers to value chain development**

Agriculture is Africa's most important sector that can address poverty and food security, but its fragmented nature hinders further development. Most farmers in Africa are smallholders who face huge barriers to enter national and global markets. Yet, access to these markets is considered critical to growth in developing countries (OECD, 2006; World Bank, 2008). The most important institutional challenges to smallholder inclusion in commercial value chains concern the formal rules, inter-organizational arrangements, and informal customs that prevent farmers from having access to knowledge & technology, credit, markets, and farmer-based organizations.

*Access to knowledge & technology* - Farmers must acquire knowledge of, and adopt quality standards that lead firms in the chains require. They need to invest in structural and procedural initiatives that make buyers trusting and having confidence in the quality and safety assurance mechanisms for their produce (Henson and Jaffee, 2006; Garcia Martinez and Poole, 2004). Quality standard certification improves the reputation of farmers and that may eventually help them retaining a higher share of the

chain income (Muradian and Pelupessy, 2005). Since the quality of rural education in developing countries is relatively low there is a need for farmer support and training in good agricultural practices (World Bank, 2008).

*Access to credit* - Lack of affordable credit is a major constraint for many smallholders to improve their process and product quality (Altenburg, 2007; Kaplinsky and Morris, 2001). Financial institutions are reluctant in providing credit to small-scale farmers because agriculture is vulnerable to unpredictable climatic circumstances and because farmers lack collateral. Broader access to financial services would expand their opportunities for technology adoption and resource allocation (World Bank, 2008).

*Market predictability* - Farmers are exposed to highly volatile markets, which hinders investments in the agricultural sector. A more stable business climate for suppliers through buyer commitment and price stability would motivate farmers investing in production capacity and quality improvement (Gibbon and Ponte, 2005).

*Farmers' organization* - Smallholders need to be organized in larger organizations to meet a buyer's requirements in terms of volumes, quality and consistency of supply. Farmer alliances facilitate risk sharing and the pooling of resources. They enable collective learning in farm management and offer farmers the opportunity to operate as a group actor that can develop a countervailing power vis-à-vis other chain actors (KIT *et al.*, 2006).

The institutional obstacles that deter farmers from investing also hinder private enterprises that follow a strategy of local sourcing and establishing backward linkages with agricultural producers in the region. For that reason some private companies join forces with development organizations in what can be coined 'value chain partnerships' to develop a commercial supply chain (Fortanier, 2006). In this collaborative arrangement, partners particularly address the chain's institutional environment, i.e. the formal and informal rules that regulate the behaviour of value chain stakeholders. For example, partnerships may promote shifts in farming customs, support banks in finding new ways of lending to farmers, encourage contract compliance among both farmers and buyers, and help farmers in organizing themselves. The changes induced in attitude and newly-built trust create opportunities for an improvement of linkages between supply chain actors, and between chain actors and facilitators.

Value chain development requires continuous attention to technical and social innovations at farmers' level. This 'upgrading' refers to the ability of a farm to acquire new technologies or management techniques in order to increase its competitiveness and resilience, and eventually improve its power position in the value chain (Bair, 2005; Giuliani *et al.*, 2005). Commonly four different forms of upgrading can be distinguished (Humphrey and Schmitz, 2004):

*Process upgrading* - Improving efficiency in the transformation of inputs into outputs by reorganizing production process or by introducing innovations.

*Product upgrading* - Moving into more qualitatively improved product lines, resulting in the addition of a new trait to the product.

*Functional upgrading* - Acquiring new functions in the chain (such as design, marketing, branding) to increase overall skill content of activities.

*Inter-chain upgrading* - Using the knowledge acquired in particular chain functions to move horizontally into more than one, or alternative chains.

Upgrading is conditional to smallholders' participation in value chains. Only by investing in social and technological innovations smallholders can enter, maintain or improve their position in value chains. Value chain partnerships are expected to facilitate upgrading opportunities for smallholders. In this way they promote sustainable improvement in the livelihoods of rural populations.

## **Methodology**

For our cross-case analysis we selected five sorghum-beer value chain development partnerships in Africa, which comprised a brewing company – the chain's lead firm – and a non-governmental organization (NGO). The five cases cover four countries: Sierra Leone, Ghana, Uganda and Zambia and include three beer multinationals: Heineken, Guinness, SABMiller, and their local subsidiaries. Together, these firms currently control nearly 75 per cent of the African beer market. SABMiller (UK) has a 43 per cent share, Heineken (Netherlands) 19 percent, and the British drinks group Diageo (owner of the Guinness brand) 12 percent (Capell, 2009).



All partnerships were analysed in respect of (a) the changes they brought about in the institutional value chain environment, referred to as 'conditions for upgrading', and of (b) changes in the actual upgrading at farmer's level, which are used as measure of the effect of the institutional changes. Data on the partnership effects was collected from relevant documents and in stakeholder interviews. In the period September 2008 - July 2009, 41 persons were interviewed covering 37 of the most important stakeholder organizations that were involved in any of the five cases. The total sample of interviewees represents farmers' organizations (9), breweries (8), local and international non-governmental

### Box 1. Sorghum beer partnerships in Africa: 5 cases

Three of the five cases form part of the *West African Sorghum Chain Development (WASCD)* project that includes the Irish brewer *Guinness* (part of the British beverages group *Diageo*), the Dutch brewer *Heineken*, the *UN Common Fund for Commodities (CFC)*, *EUCORD* (an NGO and an affiliate of the American *Winrock International*), and the American NGO *TechnoServe*. The project intends to create new income opportunities for smallholders in Ghana and Sierra Leone, and supports the local breweries of Guinness and Heineken in substituting more expensive, imported barley malt by locally produced sorghum. The five-year WASCD project has a budget amounting to in total US\$ 2.8 million provided by CFC (60%) and the two private sector partners (40%), i.e. Guinness and Heineken.

#### **Guinness-TechnoServe partnership in Ghana (2006-2011)**

The partnership under the WASCD has *Guinness Ghana Breweries Ltd* and the NGO *TechnoServe* as main partners. The latter supports farmers in Ghana's Upper West, as well as the nucleus farmers who act as grain trading intermediaries between the farmers and the brewer. The Ghanaian government participates through its *Capital Venture Trust Fund* that is related to the *SINAPI ABA Trust*, and which provides credit to farmers. The partnership was established after an attempt to establish a sorghum supply chain in Northern Ghana by Guinness had failed (Kudadjie 2006). It is based on an agreement in which the brewery agreed to buy sorghum produced under the partnership for a period of five years at a price that may vary within a certain price band.

#### **Guinness-ACDEP partnership in Ghana (2006-2011)**

This partnership includes the *Association of Church Development Projects (ACDEP)*, a local NGO that supports farmers, and the *Savanna Farmers Marketing Company (SFMC)*, a private trading company and spin-off from ACDEP. SFMC serves as commercial intermediary between farmers and Guinness Ghana. The Dutch development organization *ICCO* is sponsoring. The Guinness-ACDEP partnership was initiated in 2002 to serve smallholders in Ghana's Upper East, and could expand after the establishment of the WASCD project.

#### **Heineken partnership in Sierra Leone (2006-2011)**

In Sierra Leone the WASCD project resulted in a partnership including the *Sierra Leone Brewery Ltd* (largely owned by *Heineken*) and *Vancil Consultancy Services*, a local NGO that supports farmers and acts as grain trading intermediary between farmers and the brewer. Other partners are *Finance Salone*, a local non-profit credit provider that operates with a grant from the *Rabobank Foundation* provided via EUCORD, the *Sierra Leone Agricultural Research Institute*, and the *Rokupr Agricultural Research Center*.

#### **Eagle Lager partnership in Uganda (2000- )**

*Eagle Lager* is the brand name of sorghum-based beer sold in Uganda. The Eagle Lager partnership in Uganda started in 2003 after *SABMiller's* Ugandan subsidiary *Nile Breweries* had unsuccessfully tried to develop a local

sorghum supply chain. The partnership includes *Afro Kai*, an indigenous commodity trading company, was contracted for coordinating the *Epuripur* sorghum supply chain, the Ugandan government, and the *Serere Animal and Agricultural Institute (SAARI)*. The local NGO *Enterprise Uganda* is taking care of farmer training.

#### **Eagle Lager partnership in Zambia (2005- )**

Because of its success in Uganda, the Eagle Lager model was also implemented in Zambia in 2005. Partners are *Zambian Breweries* (owned by SABMiller) and the Zambian government. The brewery contracted *CHC Commodities*, a local grain trader, for supply chain coordination. *CARE International*, a development aid NGO, was attracted for supply chain facilitation and to support Zambian farmers producing a crop that meets the standards set by the brewery.

organizations (NGOs) (9), R&D centers (7), private grain trading companies (4), finance institutions (2), an government organization, and an academic advisor. Nearly half of these interviews took place face to face in Ghana, while the remainder was done electronically or by telephone.

The analysis followed a qualitative and interpretative approach. The interviewees' perception of partnership effectiveness, i.e. whether the partnerships had effectively induced changes in the (conditions of) upgrading at the farm, was summarized in one of three possible scores: 'none' (-), a 'modest positive change' (+/-), or a 'considerable positive change' (+). The average scores per item were later used to generate overall perceptions by stakeholders per case. The issues on which stakeholders differed in their opinions are explained in the analysis. Box 1 provides the overview of the five partnership cases.

#### **Establishing commercial sorghum value chains**

Table 1 shows that all partnerships have managed to create a local value chain for sorghum. The largest volumes have been produced under the Ugandan Eagle Lager partnership where over 70 per cent of the brewer's demand was met in 2009. This is partially related to the favourable growing conditions in Uganda (Balya, 2006). In contrast, farmers producing under the two Guinness partnerships in northern Ghana have to cope with erratic rains and poor soil conditions. They have supplied less than a quarter of total industrial demand for sorghum. Since the breweries expect the partial shift from imported barley to locally produced sorghum to continue in all four countries in the future, the market for commercial sorghum is likely to remain and perhaps even to grow.

**Table 1. Sorghum supply for commercial brewing under five African partnerships:  
Key characteristics**

Guinness-TechnoServe (Ghana) 2009 <sup>1)</sup>	Guinness- ACDEP (Ghana) 2008 <sup>1)</sup>	Heineken (Sierra Leone) 2009 <sup>1)</sup>	Eagle lager (Uganda) 2009 <sup>1)</sup>	Eagle Lager (Zambia) 2010 <sup>2)</sup>
<b>Production</b>				
Total volume supplied (MT kgs)				
2,500	58	150-180	4,700	300
Total potential demand buyer (MT kgs)				
10,000 <sup>2)</sup>	10,000	200	6,500	N/A
<b>Farmers</b>				
# of farmers involved (2009)				
>5000	6800	2500	8000	4500
% of smallholders (<5 acres)				
85	100	75	90	>90

<sup>1)</sup> Source: Interviews with various stakeholders and internal NGO documents

<sup>2)</sup> Mutumweno, 2010

The five partnerships have also been successful in establishing the backward linkage between breweries and smallholders. Sizeable numbers of farmers have been included in the chains, the far majority being smallholders. The actual numbers are likely higher when unregistered outgrowers and farm labourers are included. The Zambian supply chain started with commercial large-scale producers but in less than four years smallholders have become the prime sorghum suppliers.

### **Conditions for upgrading**

All partnerships have addressed the main institutional challenges for local sorghum farmers. Table 2 presents the findings in the four main areas, which are explained below.

#### Access to knowledge & technology

The sorghum-beer partnerships have promoted the adoption of specific sorghum varieties that are suitable for industrial beer processing. Generally there are two kinds of varieties. Red and brown varieties contain tannins that cause a bitter taste and cloudiness in lager beer. White and yellow varieties contain significantly less tannins and are the only ones accepted by the breweries. In all cases national research institutes have been working on varietal improvement in order to offer farmers higher-yielding varieties. Nevertheless, everywhere farmers resort to local varieties that were already in



use. In Ghana, one NGO pointed out that the new Guinness chain had made the national research institute more focused on varietal characteristics that farmers need for their market. The agricultural stations would have become more business minded too. The extension workers were perceived to be more aware of production costs which they now try to reduce, and of the importance of quality, including documentation and traceability.

All partnerships (except Sierra Leone) encourage farmers to change their custom of using a part of their crop as seed for the next crop cycle, which reduces costs and ensures seed availability. Instead, farmers are encouraged to buy fresh, certified seeds for every crop cycle. Nile Breweries in Uganda does not even allow the farmers to retain their seed. There was consensus among the research institutes, grain traders, and breweries that certified seeds are genetically more homogeneous; they yield bigger and neater grains, and their germination and oil content are better. The main impediment to the spread of certified seeds in the three West African cases is their limited availability. Since sorghum is an open-pollinating crop farmers can easily re-use grains as seed for the next crop cycle, a practice that reduces farmers' costs, but also the incentive to invest for seed producers.

Another significant shift brought about by the partnerships is the investment in farmer training. Every partnership includes an NGO to complement existing governmental extension services in the training of sorghum farmers in farm management, quality issues, financial matters and farmer organization. In the Ghanaian Guinness-TechnoServe partnership, nucleus farmers play a significant role in training. Only in Uganda, the brewery is also active in farmer training.

The Guinness-TechnoServe partnership emphasizes the role of advanced technology in the sorghum production, while this is considered to be less relevant in other partnerships. In Zambia, sorghum farmers have often opted for 'conservation agriculture', which requires a minimum of equipment. This reportedly results in better crop yields, improved soil fertility, better rainwater harvesting, nitrogen fixation and fewer weed problems (Mutumweno, 2010).

#### Access to affordable credit

Partnerships have two options for improving farmers' access to affordable credit. The first involves credit that is being made available from within the chain, by the grain trader or the brewery. All

partnerships have managed to improve access to credit in this way. In both Ghanaian Guinness chains, sorghum farmers can apply for a credit from the agricultural development bank that can tap from a government fund. The loan is made available through either the grain trader or nucleus farmers. In the Ugandan and Zambian cases, changes in the credit opportunities were deemed not necessary, because sorghum is considered to be a low cost product and inputs are being subsidized. However, the breweries in both countries offer seed as in-kind loan to farmers, while Zambian Breweries also pays in advance. In all cases, the interest rates for (in-kind) loans tend to be lower than commercial rates.

The second option involves financial sources external to the chain, notably commercial banks. Success in this area was only reported by the two Guinness partnerships that benefitted from the WASCD project. Some rural banks have become more willing to lend to farmers, because the 5-year market prospect provided by this project enhanced the credibility of sorghum farmers. In the Guinness-ACDEP case, around 60 per cent of the farmers sourced credit from banks. The Heineken partnership in Sierra Leone involves a local micro-credit provider (Finance Salone) that uses a grant from a foreign microfinance institution to make loans available to sorghum farmers. In the two Eagle Lager partnerships the breweries have recently opened up negotiations with banks. In all cases the banks are only interested in group lending.

### Market opportunities

All five partnerships address the unpredictability of the market. The brewing companies involved agreed to negotiate a guaranteed annual price in the pre-planting period. In Ghana and Sierra Leone the negotiations are basically between respectively Guinness Ghana and Heineken, the NGOs, and advisors. The involvement of farmers in price negotiations is negligible. The NGOs develop a crop budget based on latest input prices, which serves as guide in the negotiations. The nucleus farmers in Sierra Leone and Ghana and the grain trader SFMC in the ACDEP-Guinness chain follow the price set in this meeting. Because sorghum can also be sold on local food markets, side selling is discouraged by setting the price slightly above the local market price. In Uganda and Zambia the partnerships are, according to a brewery representative, based on “hard-nosed business principles”, which means that the breweries pay the market price only. The brewery says it tries to reduce price volatility though.

In respect of purchase commitments, all breweries enter into annual purchase agreements with the private commodity trader or the nucleus farmers. In the three West African cases, the annual agreements are part of a longer-term commitment by Guinness and Heineken for a period of 5 years.

### Farmer organization

The partnerships have achieved farmer integration in the sorghum supply chains in two distinct ways. The Heineken and Guinness-TechnoServe partnerships have organized smallholders through the nucleus farmer – outgrower model under facilitation of the NGOs. The farmers’ organizations follow a hierarchical model: the registered smallholders work under the management and control of commercial farmers. The model ensures a clear structure and ownership and eases monitoring. The nucleus farmers are supposed to become the key suppliers to the brewery when they take over the chain coordination after the NGO has left in 2011. The Ugandan Eagle Lager partnership develops a similar model. Because of risks of quality and supply disruption, the partnership intends to have 70 per cent of production supplied by farmers organized and under the management of medium and large-scale commercial farmers by 2014.

A more horizontal organization for smallholder integration in the sorghum chains has been achieved in the two other partnerships. In Zambia, all smallholders are organized in 16 FBOs, primarily cooperatives, which take care of collection and monitoring, and serve as intermediary between the farmers and traders. All farmers linked to FBOs are considered to be contract farmers. The Ghanaian Guinness-ACDEP partnership stresses the importance of horizontal farmer organization even more. The NGO attributes the absence of economies of scale and the weak bargaining power of farmers to a lack of organization. It disapproves of the nuclear farmer model that is being followed by the second Ghanaian partnership and explicitly promotes democratic farmer organizations through training of group formation.

**Table 2 Partnership effects: Stakeholder perceptions of changes in the conditions for upgrading**

	G-T Gha	G-A Gha	Hein SL	EL Ug	EL Za
Access to knowledge & technology					

Availability of new, improved sorghum varieties	-	+/-	-	-	+/-
Farmers promoted to use fresh, certified seed	+	+/-	+	+	+
Fertilizer and agro-chemicals made available	+	-	-	-	-
Training in crop management & post-harvest treatment	+	+/-	+	+	+
<b>Access to affordable credit</b>					
Banks more willing to lend	+/-	+	+	-	-
Lead firm or special chain-related funds more willing to lend	+	+	-	-	-
<b>Market opportunities</b>					
Multiple-year market prospect	+	+	+	-	-
Annual purchasing commitments	+	+	+	+	+
Annual pre-planting price guarantees	+	+	+	+	+
<b>Farmer organization</b>					
Cooperative farmer-based organizations	-	+	-	-	+
Nucleus farm – outgrower organization	+	-	+	+	-

### Upgrading at the farm

A relevant indicator for the degree of changes in the institutional environment is whether upgrading at the farmers' level has indeed taken place. Table 3 shows the effectiveness of the partnerships in this respect. The explanation of the perceived changes in upgrading follows below.

#### Process upgrading

Yields per acre have reportedly doubled in Guinness-TechnoServe and Ugandan Eagle Lager cases, and “improved” in the Heineken and Zambian Eagle Lager cases, although they remained among the lowest in the world. The Ugandan Eagle Lager partnership was so successful in 2006 that farmers produced an excess supply. Partners now face the challenge of combining a higher productivity with containing the overall growth in sorghum supply, which is done through the distribution of seeds. Only in the Guinness-ACDEP case no productivity increase was reported. The NGO is reluctant to focus narrowly on yields, because it would encourage farmers to take investment risks in unpredictable markets and an unstable natural environment. According to the NGO, farm viability and sustainability require a focus beyond yield (van Wijk *et al.*, 2009).

Better farm management, lower crop losses and improved post-harvest treatment were among the reasons for higher productivity. The Guinness-TechnoServe partnership also invested in technology, including tractors, threshers and fertilizer that were acquired by nucleus farmers. In all partnerships the interviewees said that the use of certified seeds had substantially increased. On the other hand,

production costs increases were reported especially in the three West African cases. Higher oil prices have significantly raised prices of fertilizer, ploughing and transportation.

### Product upgrading

The sorghum that is supplied to the brewers must have qualities that make it suitable for industrial beer processing and needs to be tested by the brewery before seeds of the variety can be distributed. Although national and international research institutes were said to work on varietal improvement, none of the partnerships has resulted in new sorghum varieties that make it easier for farmers to meet the quality standard of the breweries. One newly developed variety, *Kapaala*, had been introduced in northern Ghana by Guinness in 2002, but it proved to be not suitable to the environment (Kudadjie, 2006). Instead, farmers resorted to a well known and suitable local variety, *Dorado*, as did farmers in the other partnerships. Ugandan farmers have shifted to *Epuripur*, a variety that was bred in the 1990s, before the partnership was established. Apart from varietal improvements, all interviewees point out that there is more attention to quality aspects along the chain, resulting in lower rejection rates.

### Functional upgrading

The relatively short length of the sorghum-beer value chain implies that there are few new value-added opportunities. Most possibilities can be found in sorghum collection, bulk-storage, cleaning, weighing, bagging, quality checking and transportation. These functions are generally taken care of by the grain trader (Uganda), an NGO that is assigned by the grain trader (Ghana-ACDEP), the nucleus farmers (Sierra Leone en Ghana-TechnoServe), or the farmer cooperatives (Zambia). Most interviewees point out that these are the actors that can scale-up the sorghum business and improve efficiency in the chain. The same actors have also been able in most partnerships to provide new services to (groups of) smallholders, such as access to credit, access to improved and/or certified seeds, fertilizers, tractor and threshing services.

From this point of view, the partnerships did result in functional upgrading by the better-equipped chain actors. However, with the exception of sorghum collection, the out-growers or other smallholders lack the logistic capacity for these activities. For them, the partnerships have achieved little in terms of functional upgrading.

### Inter-chain upgrading

In a narrow context, inter-chain upgrading comprises of opportunities to sell sorghum in alternative chains, but there are very few of such chains. The partnerships have managed to develop an interesting new commercial supply chain for sorghum as alternative to local food markets, which in itself is an example of inter-chain upgrading. Only in Ghana a competing firm - Accra Breweries – reportedly considers using sorghum for beer, which would open up an alternative chain for commercial sorghum.

In a broad context, inter-chain upgrading refers to farm-level diversification which is vital to farmers operating in largely unpredictable markets and natural environment. The risk of farmers being included in commercial supply chains is that monocropping is encouraged by the buyer for efficiency and quality purposes. Only under the Guinness-ACDEP partnership in Ghana farmers are actively supported to grow other cash crops next to commercial sorghum. In other partnerships, stakeholders consider farmers smart enough to spread their risks themselves.

**Table 3 Partnership effects: Stakeholder perceptions of upgrading at the farm**

	G-T Gha	G-A Gha	Hein SL	EL Ug	EL Za
<b>Process upgrading</b>					
Productivity increase	+	-	+	+	+
- Increased use of certified seeds	+	+	+	+	+
- Better farm management	+	+	+	+	+
- Investment in technology	+	-	-	-	-
<b>Product upgrading</b>					
Shift to varieties accepted by the brewery	+	+	+	+	+
Enhanced attention to quality aspects	+	+	+	+	+
<b>Functional upgrading*</b>					
Collecting, storing, cleaning, checking, bagging and transporting sorghum	-	-	-	-	-
<b>Inter-chain upgrading</b>					
Diversification actively encouraged by partnership	-	+	-	-	-

\* Refers to farm level only; some functional upgrading opportunities for traders and nucleus farmers have increased

### **Conclusion and discussion**

The sorghum market for commercial beer production in the four African countries constitutes a unique opportunity for agricultural development. Breweries have embarked on a longer term strategy to substitute imported barley by local, cheaper substitutes, and these new supply chains are not affected

by international trade barriers or demanding foreign quality standards. However, these chains could not develop without partnerships that were necessary to initiate a number of important institutional changes. In all cases stakeholders agreed that the partnerships have played an important role in stabilizing the market through the promotion of contract farming and in organizing farmers into more efficient production units. Some knowledge and technology have been transferred through farm management training, and the three West African partnerships advanced arrangements that offer farmers better credit opportunities. The institutional changes are to some extent reflected in adjustments in farm customs: more use of certified seed, better farm management, and, overall, more attention to quality aspects.

The cross-case analysis also showed a number of interesting differences among the partnerships. First, only the Ghanaian Guinness-ACDEP partnership addresses the potential problem of value chain partnerships becoming too much focused on a single crop. Such a narrow focus is reflected in the improvements at farm level that were observed: in all cases these are limited to productivity and quality, and hardly extend to inter-chain upgrading. The latter form of farm improvement is not the prime interest of the breweries, but could significantly support the resilience of farmers who have to rotate their crops and spread their risks. The Guinness-ACDEP partnership supports farmers in producing a set of cash crops rather than one.

Second, the Eagle Lager partnerships work with private grain traders as intermediary between farmers and brewery, and appear to have a more commercial foundation compared to the three West African partnerships where NGOs play a key role as grain intermediary. This is presumably related to the more developed business environment in Uganda and Zambia. In the West African regions, grain traders had to be founded first before a “chain” could actually develop, and NGOs temporarily fill the void. The West African partnerships therefore depend more on donor funding than the Eagle Lager cases. Nevertheless, in all chains NGOs are required to complement existing governmental extension services in farm and management training.

A third major difference was found in the way the partnerships organize farmers. Three partnerships follow hierarchical models to integrate smallholders into the chain mainly by using nucleus farmers, whereas two partnerships intentionally support more horizontal, farmer-based organizations. The Guinness-ACDEP partnership is fully committed to establishing democratic farm organizations that work

on up-scaling of production and empower farmers. The partners are reluctant to follow the nucleus farm model, because it would introduce new hierarchies and opportunities for exploitation by the nucleus farmer. However, in terms of volumes produced, the second Ghanaian Guinness partnership performs far better.

Finally, a question can be posed in respect of the durability of the institutional changes induced by partnerships. It is yet not clear how the differences among the partnerships influence longer-term effects of the interventions. Additional research is required to examine the effects under the various partnership strategy modalities: single/multiple crop focus, the nature of the grain traders, and the manner smallholders are included in cash crop chains.

Another aspect concerns the role of governments. In the five African partnerships, governments are only remotely involved and play a limited role through their research and extension services, tax policies to encourage smallholder inclusion (Zambia), or credit opportunities (Ghana). This raises the issue of value chain partnerships potentially replacing rather than complementing governments in providing the appropriate institutional infrastructure needed for sustainable supply or value chains. Yet, it is the government that is required to make institutional changes durable and have them adopted in other chains and other sectors in the country.



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