

Boosting commercial sorghum production and marketing with the “aggregator model”

How can the private sector contribute to the fight against hunger, poverty and malnutrition in the remote areas of sub-Saharan Africa? This article looks at a model that has been applied in Kenya and Tanzania, addressing the right tools, skills and knowledge to make smallholder production a success.

Since 2009, Africa Harvest Biotech Foundation – in partnership with the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) – has adapted various iterations of the “aggregator model” in increasing the production and marketing of sorghum among smallholder farmer groups in the Arid and Semi-Arid Lands (ASALs) of Kenya and Tanzania. The aim was to address barriers and bottlenecks along agri-based value chains. The project used the whole value chain (WVC) approach to increase production and productivity as well as to link smallholders to markets for surplus produce. This is a sustainable approach to household food and nutritional insecurity, incomes, natural resource management and the overall development agenda. Smallholder farmers were organised into development and commercially focused smallholder production and marketing groups (SHPMs). Using a market-pull strategy, Africa Harvest worked with the SHPMs to align downstream value chain activities to specific end-market demand parameters (variety, quality, quantity, timeliness and consistency). The process started with the identification of a ready market where demand outstrips supply, with the household nutritional needs as a critical first stop. Experience

has shown that risk-averse smallholder farmers will first produce what satisfies their household needs before turning to markets. The value chain has to appeal to these needs before commercialisation can be adopted.

“Aggregator model” is a term which originates from E-commerce, defining a business model where a firm (that does not produce or warehouse any item) collects (aggregates) data and information on goods and/or services from several competing sources at its website. In our case, the model means a close co-operation of all stakeholders in the sorghum value chain. Adaptation ranges from direct intervention by Africa Harvest in service provision to the current iteration where an entrepreneurial sorghum farmer or trader is identified and supported to provide both downstream (input services to farmers) and upstream (linkage to market) services, on a commercial basis. Our experience is that this farmer or trader often starts as a community or opinion leader; as the individual builds confidence and business gains traction, the aggregator is formalised into a business.

Seed funding to work on the model came from the United Nations Development Programme (UNDP), through the Africa Facility for Inclusive Markets (AFIM) programme. The funding was to kick-start activities such as community mobilisation, producer groups formation and initial training. The funds were also catalytic to the process of initial proof of the concept phase, which involved piloting the model in Kenya and Tanzania explained below. Other donors included the International Fund for Agricultural Development (IFAD) and the European Union (EU).

■ The sorghum value chain challenges

The Arid and Semi-Arid Lands (ASALs) in Kenya and Tanzania are all remote rural areas, lacking good infrastructure (road and communication networks), having limited options for livelihood support, and generally being neglected

The aggregator in Tharaka, Kenya, with her tractor and thresher. Provision of input services as well as linkage to market is part of the aggregator model.

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in development initiatives. Nonetheless, these areas have huge tracts of idle and virgin land that is good for agriculture and get sufficient rain to sustain drought-tolerant crops like sorghum, cowpea and others. Communities living in these areas have limited options for commercial crop production, given their over-reliance on rainfed agriculture. With the right tools, technology, skills and knowledge, they can intensify production of cereals (like sorghum) and pulses (e.g. cowpea).

The dispersed pattern of habitation and the dilapidated road networks in these rural areas do not attract the traditional business person, who will seek low transaction costs. Also, changing weather patterns and especially the incidence of drought have rendered these areas more disenfranchised given the dearth of risk mitigation tools and limited knowledge and skills to enhance adaptation and coping mechanisms. Yet these rural areas are home to 70 per cent of the entire population in Africa and will continue to play a critical role in feeding rising populations in the future. This bottom of the pyramid opportunity offers a huge pool for potential buyers of manufactured products and suppliers of inputs that should contribute to poverty eradication if well harnessed.

The main bottlenecks to raising production and productivity in these ASAL areas include:

- limited to no access to inputs: improved variety seeds, information, crop protection inputs, and financial services;
- limited skills and knowledge in good agronomic practices required to exploit the full potential in improved inputs (particularly seeds);
- limited knowledge of market requirements;
- limited knowledge in harvesting and post-harvesting management;
- limited access to labour-saving machinery for land preparation, harvesting and threshing, to minimise the drudgery of labour-intensive agriculture;

Success factors

For the aggregator model to succeed, the following critical factors should be in place or be developed:

- Willing commercial **end-market players**. In the case of sorghum in Kenya and Tanzania, East African Breweries Limited (EABL) took a strategic decision to have sorghum as part of its input in beer manufacturing.
 - An entrepreneurial individual (a farmer and/or trader) willing to provide **aggregation services**
 - A network of **sub-aggregators** for services at village level.
 - A **capacity building partner** (“value chain champion”) to intermediate the process and ensure good governance in the value chain. Africa Harvest plays this role. This partner is also involved in the provision of information and market intelligence and may have to sustain activities before the aggregator is well entrenched. In addition, Africa Harvest helps streamline value chain bottlenecks as they occur before handing over to other players/stakeholders, supporting government (e.g. county government) in facilitating value chain activities from a policy point of view.
 - Other service providers, including banks and microfinance institutions.
- limited capacity to operate as economic units that appeal to value chain players, particularly large corporations with an eye on the bottom line.

Adapting the model to sorghum production

In the course of implementing various sorghum development projects, the aggregator model was identified as a good option to address the gulf between end-user markets (excess demand) and smallholder farmers (lacking in capacity and motivation to produce for commercial markets). End user markets require commercial quantities of raw materials at reasonable input prices while farmers need access to inputs, information, capacity building, and aggregation of low produce quantities into commercially feasible units as well as land preparation, harvesting and threshing facilities.

The aggregator therefore intermediates the value chain at that remote location by providing access to inputs required to increase production and productivity, while facilitating access to markets through their business development capacities. He also provides a cen-

tral point through which financial intermediation as well as other value chain enhancement interventions can be directed to target smallholder farmers.

In addition, the aggregator requires a system of sub-aggregators (such as cereal traders) scattered around the remote villages that provide sub-aggregation services (buying of marketable produce) for a fee. This helps to make the entire system sustainable and inclusive since packing the produce and loading it onto trucks requires labour. It also ensures a good system through which seeds and other inputs can be accessed in remote villages. In the ideal situation, the aggregator should be empowered to provide all services required by smallholder farms including extension, setting up of demonstration plots as well as banking facilities.

Adding a nutrition component

The model could be enlarged by a nutritional aspect: Adopting the production of other drought-tolerant crops – particularly legumes and pulses – has the dual benefit of first providing a rotational crop for sorghum production. This improves soil fertility and provides nutritional benefits through



Photo: Africa Harvest

A sorghum demonstration plot in Tharaka, Kenya. The provision of improved seeds is one of the core aspects of the sorghum development projects.

– opens up local economies, improves nutrition of rural households through consumption of eggs and chicken meat, increases incomes from sale of chicken products

access to plant protein as well as vitamins and minerals from the edible leaves of these legumes. Cowpea is a good example of such duality with its leaves used as vegetables (vitamins and minerals) and the bean providing plant protein. Here, the basket of choice for the farmers can be expanded to include an array of legumes and pulses that are developed by the centres of the Consultative Group on International Agricultural Research (CGIAR) and national agricultural research centres, e.g. cowpea technologies developed by the International Institute of Tropical Agriculture (IITA).

Researchable areas could also include the use of bio-fertilisers in improving soil fertility/nitrogen fixation and how this could improve productivity in sorghum. The aggregator would still provide the services of linking SHPMs with improved quality seeds, training on best practices and onward linkage to markets for surplus produce.

■ Diversification of livelihoods

The sorghum value chain also provides a base for a number of other job creation avenues in rural settings. There are good opportunities for livelihood diversification strategies through implementation of an integrated farming systems approach. Adding a component of short-cycle livestock – traditional as well as improved-chicken breeds

and improves the household asset base. Youth and women would particularly benefit from this enterprise since it requires less input in terms of capital and is easier to manage. Using sorghum as chicken feed would also open up entrepreneurial opportunities for local-level industries to supply chicken farmers with feeds, further unlocking value for sorghum farmers.

Other alternatives could include the introduction of dairy goats whose feed would come from sorghum stovers while improving household nutrition through milk production and increasing household assets (improved goats). An agro-forestry component using dual-purpose shrubs (e.g. *calliandra* and *leucena*) for fodder (goats) and soil fertility management can further complement this diversification strategy while enhancing natural resource management (soil fertility).

■ Promising results

Between September 2012 and August 2013, Africa Harvest carried out a pilot project on the efficacy of the aggregator model in both countries in Kenya and Tanzania. The pilot was implemented among 2,500 smallholder farmers who had set aside a minimum of three acres of land for sorghum production (monocrop) and used inputs to increase productivity. Key achievements from this pilot were:

- Enhanced awareness, among smallholder farmers, on the availability of regional markets for sorghum grain (15,000 farmers were reached by the project);
- Access to improved seeds and other inputs (including fertilisers) for 2,500 smallholder farmers in both Kenya and Tanzania;
- Enhanced capacity of these farmers to increase production and productivity in sorghum from 450 kg/acre to 1,000 kg/acre (on average);
- Increased quantity of sorghum grain reaching commercial markets by 129 per cent – from 2,388 metric tons (MT) to 5,469 MT – in Kenya and Tanzania (through the aggregators);
- Enhanced capacity of aggregators to provide services to farmers through direct facilitation and linkage with financial service providers. The total volume of sorghum grain delivered to East African Malting Limited (a subsidiary of East African Breweries Limited, EABL) by the five aggregators working with the project was 5,469 MT. This grain had a market value of over 2 million US dollars (USD). The total amount made by smallholder farmers was over USD 1.5 million (72.7 % of the market value of the grain traded), within twelve months of project implementation.

These preliminary findings provide evidence that the aggregator model has the potential to catalyse improvements and impact among smallholder farmers involved in sorghum production in ASALs. Corporations ought to play a greater role in enhancing food security, income generation and the reduction of malnutrition among the rural poor. The use of inclusive business models like the aggregator model to address barriers and bottlenecks along agri-based value chains should be promoted as they can help unlock superior economic value, provide much needed jobs for youth and women and improve livelihoods.

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