MARKET ARRANGEMENTS USED BY SMALL SCALE BEAN FARMERS IN KENYA: WHAT NEEDS TO CHANGE FOR SUSTAINABLE TRADE VOLUMES?

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ABSTRACT

Markets and marketing of common beans (*Phaseolus vulgaris* L.) is a major issue of concern to small scale farmers and other actors in the bean value chain in Kenya, particularly inconsistency in supplying sufficient volumes required for trade. This case study assessed market arrangements used by small scale farmers in the Lake Basin and Lower Eastern bean corridors of Kenya, to determine which markets work for rural producers and what changes are needed to produce and supply sufficient quantities for trade. Using exploratory research, data were collected through Focus Group Discussions with six farmer groups, representing a total of 1255 bean farmers; and key informant interviews with extension staff. The results indicated that 94% of the farmers produced beans before identifying buyers, while only 6% participated in group marketing. Though spot-market transactions with brokers and traders provided ready cash for the farmers, formal buyers were perceived to be more reliable, but difficult to find, and operated the stringent requirements, which were a barrier to entry. Based on the study findings, sustainable production and supply of sufficient volumes for trade should entail a transformation agenda at four levels of the value chain; namely intensification of production through pure stand models with greater use of certified high yielding varieties; stable price guarantees; market-driven research and extension service; and an enabling policy and business environment in the bean value chain. Further research is needed to pilot these changes in a case control study.

Key Words: *Phaseolus vulgaris,* spot-marketing, value chain

RÉSUMÉ

Les marchés et la commercialisation des haricots communs (*Phaseolus vulgaris* L.) constituent un sujet de préoccupation majeur pour les petites entreprises les agriculteurs et d'autres acteurs de la chaîne de valeur du haricot au Kenya, en particulier les incohérences dans l'approvisionnement volumes suffisants requis pour le commerce. Cette étude de cas a évalué les accords de marché utilisés par les petites d'agriculteurs dans les couloirs de haricots kenyans du bassin du lac et du Bas-Est, afin de déterminer les les marchés fonctionnent pour les producteurs ruraux et quels changements sont

nécessaires pour produire et fournir suffisamment quantités pour le commerce. À l'aide de recherches exploratoires, les données ont été recueillies lors de discussions de groupe avec six groupes d'agriculteurs, représentant un total de 1255 producteurs de haricots; et entretiens avec des informateurs clés personnel de vulgarisation. Les résultats ont montré que 94% des agriculteurs produisaient des haricots avant d'identifier acheteurs, alors que seulement 6% ont participé au marketing de groupe. Bien que les transactions sur le marché au comptant avec des courtiers et les commerçants fournissaient de l'argent disponible aux agriculteurs, les acheteurs formels étaient perçus comme plus fiables, mais difficile à trouver et appliquait les exigences strictes, qui constituaient une barrière à l'entrée. Basé sur résultats de l'étude, la production durable et la fourniture de volumes suffisants pour le commerce devraient impliquer une programme de transformation à quatre niveaux de la chaîne de valeur; à savoir l'intensification de la production par modèles de peuplements purs utilisant davantage de variétés certifiées à haut rendement; garanties de prix stables; axé sur le marché service de recherche et de vulgarisation; et une politique favorable et un environnement commercial dans le haricot chaîne de valeur. Des recherches supplémentaires sont nécessaires pour piloter ces changements dans une étude cas-témoins.

Mots Clés: *Phaseolus vulgaris*, marketing ponctuel, chaîne de valeur

INTRODUCTION

Common bean (*Phaseolus vulgaris* L.) is a major staple food in Africa, where it is recognised as the second most important source of human dietary protein, and third source of calories of all agricultural commodities produced in the region (Birachi *et al*., 2011; Buruchara *et al.,* 2011). It is the most important legume in Kenya, valued as a cheap source of protein, especially for the low income population and consumer institutions such as schools, colleges, hospitals, prisons and food relief agencies (Government of Kenya, 2013). Common bean is grown by more than three million households, majority of whom are small-scale farmers in Kenya (Katungi *et al*., 2009).

Common bean has a short growth cycle, which permits production when rainfall is erratic, provides food and income to the household before harvesting of other long season crops such as maize. It is cultivated twice a year in March to April and September to October at altitudes between 600-2000 meters above sea level.

Despite its importance to many households, the marketing of common beans is a major issue of concern to small scale farmers, and remains a key challenge that needs to be addressed in order to enhance sufficient quantities for trade.

Different organisations have used various approaches to link small scale farmers to markets, including provision of market information, organising farmers into groups, associations or cooperatives, contract farming and out-grower schemes (Winter *et al*., 2005). However, there is limited information regarding the type of market arrangements, which work better for small scale farmers.

A study by USAID (2010), reported that farmer linkages to formal markets such as processors and institutional buyers in Kenya were very weak. In addition, data from market actors indicate that there is, in fact, significant unmet demand for common beans in Kenya. The deficit is expected to increase given the increasing population, rising costs of animal based proteins and health conscious consumers shifting to plant proteins. Studies done in the East African region indicate that beans are sourced from small scale farmers and marketed through long informal channels consisting of many intermediaries along the value chain (Kibiego *et al.*, 2003; Korir, 2005; Mauyo *et al.*, 2010). These studies further indicate that although farmers determine the proportion of beans marketed, it is the traders who determine the prices offered.

There are mainly two types of market arrangements often cited in literature; namely spot market transactions and collective action (Poole and Freece, 2010; Poku *et al.*, 2018).

Spot market transactions is the informal marketing pathway consisting of many intermediaries, and where local assemblers, brokers and traders are the main buyers of common beans from small scale farmers. It is the most important marketing channel for common beans in Eastern, Central and Southern Africa (Sichilima1 *et al.*, 2016). The second market arrangement is collective action. In this arrangement, smallholders market farm produce through farmer organisations, contract farming or out grower schemes to formal institutions. It is a vertically coordinated chain relationship, in which large buyers such as Cereal marketing Boards, Food processors, Wholesalers, Supermarkets, Schools, Hospitals, Exporters, and Relief agencies enter into formal or informal agreement (Poku *et al.*, 2018).

Cook and Chadad (2004) observed that collective action among smallholder farmers can enhance agricultural production, bargaining power, reduction of transaction costs, formation of social capital, gender inequalities, provision of technical assistance and input services, acquisition of techno-managerial skills and advocacy. Nevertheless, several studies report that the challenges of operating agricultural enterprises in a highly dynamic and competitive global economic and technological environment have seen many farmer organisations or contract arrangements world-wide either decline or exit (Cook and Chaddad, 2004; Ortmann and King, 2007). In Africa, contract farming for staples, especially cereals has had limited success (Poole and Freece, 2010; Oya, 2012). With Africa's population set to double to 2.5 billion by 2050, the need to develop appropriate market linkages and models for smallholders as a pull factor for increased food production is urgent (AGRA, 2017).

The objective of this study was first, to determine the most effective and suited type of marketing arrangement for small scale farmers and secondly, identify bottlenecks to its performance and interventions needed to produce and supply sufficient volumes to the market, using a case study of the lake basin and lower Eastern bean corridors of Kenya.

METHODOLOGY

Study area. The study was carried out in Homa Bay County in the Lake Basin; and in Machakos and Makueni Counties in Lower Eastern Kenya, during March and April 2017. The Lake Basin and Lower Eastern Kenya represents an important bean corridor in Kenya. Homa Bay lies between $0^0 15$'S to $0^0 52$'S and 34^0E to 35'E at altitude 1240 - 1580 metres above sea level; while Machakos and Makueni lie between $0^0 31$'S to 3.00^0 S and 36.45^0 to $38^0 30$ E, respectively. Rainfall in both regions is bimodal (March-May and September – November, and ranges between 300 and 1300 mm annually. Homa Bay has 31000 hectares (ha) under beans, while both Machakos and Makueni have a combined area of 113,000 ha under bean production (Government of Kenya, 2013).

Study structure. Data for this study were collected using interviews with key informants from the Ministry of Agriculture and six Focus Group Discussions (FGDs) representing a total of 1255 bean farmers. The FGDs were carried out with farmer groups to gain a deeper understanding of the following parameters namely; production characteristics and marketing arrangements; Strengths, Weaknesses, Opportunities, and Threats (SWOT) of the bean value chain; marketing arrangements suited for smallholder farmers; and the type of changes needed to produce and supply sufficient volumes of beans to the market. Each FGD comprised 12 participants randomly selected from each group (Krueger

and Casey, 2000). Each FGD comprised 12 participants stratified in each group and randomly selected (Krueger and Casey, 2000). During discussion sessions, farmers rated important issues through a pair-wise ranking method (Krueger and Casey, 2000). All combinations were done and responses were recorded and visualised on flipcharts. Key informant interviews were also done with extension staff to triangulate information from FGDs. Quantitative data were analysed using descriptive statistics; while quantitative data were analysed by examining similarities and comparing incidents across groups.

RESULTS AND DISCUSSION

Formal and informal markets. The results of FGDs identified two types of bean marketing arrangements commonly used by small scale farmers; namely informal marketing arrangement consisting of brokers, traders, individual consumers; and formal marketing arrangement, mainly local schools, hospitals and food processors. Using the End Market Analysis Tool Kit (USAID, 2008), from the parameters shown in Table 1, formal markets were rated higher than informal markets in all the five variables (which included: quantity, quality, price, reliability and existence of governance structures). Previous studies, however, showed that most of the beans in Kenya were marketed through informal

channels (Kibiego *et al.*, 2003; Mauyo *et al.*, 2010). Thus, the findings of this study show a contrast between farmers' rating of markets and actual practice. This scenario is further explained from the results in Table 2, which show that farmers preferred informal marketing because market agents were readily available in the rural areas and more over it was a cash market. On the other hand, farmers revealed that though formal markets were more reliable, they were difficult to find, and operated rigorous standards which were a barrier to entry. Thus, our findings suggest that in small holder bean farming systems, informal markets work for farmers despite their imperfections such as price exploitation, purchase of low volumes, lack of standard measurement scales and unreliability.

Producing and supplying volumes for trade. With bean consumption trends estimated to be 748,000 MT per *annum,* against a production of 613,000 (Government of Kenya, 2013), there is urgent need for strategies that can sustain production and supply of sufficient quantities for trade. The results in Table 3 indicate that the common bean value chain in the country has key strengths and opportunities, namely the existence of many small scale farmers estimated at more than 1255 in the study area, appropriate soils for production, a growing demand and existence of many support institutions for technologies

TABLE 1. Prioritisation and ranking of bean markets by small scale farmers in major bean producing areas in Kenya

Parameter	Informal market	Formal market
Quantity	2	3
Quality	0	5
Price	1	4
Reliability	1	4
Availability of governance structure	0	5
Total weight	4	21
Rank	2	1

Weights: 1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high

TABLE 2. Reasons for farmers' preference of market arrangement in major bean producing areas in Kenya

Attribute	Informal marketing (brokers, retail traders)	Formal marketing (schools, hospitals)
Advantages	Cash market	Bulk purchase
	Buyers readily available	Bulk payment
	Does not choose variety	Reliable
	Regular trading relationship	Transparent weighting system
	Own transport	
Disadvantages	Price exploitation	Delayed payment
	Low volumes purchased	High quality demanded
	Lack of standard measurement scale	Difficult to find
	Unreliable (spot market transaction)	Weak relationship

Source: Focus group discussion and interviews

TABLE 3. Strengths, weaknesses, opportunities and threats (SWOT) of bean value chain in the Lake Basin and lower eastern bean producing regions in Kenya

Strengths	Opportunities
Many bean farmers	Growing demand nationally and regionally
Soils appropriate for bean production	Availability of support institutions for seed and agro chemicals
Individual land ownership	Existence of technologies to increase yields
Weaknesses	**Threats**
Use of grain of different varieties as seed	Pests and diseases
Lack of knowledge on varieties demanded by market	Unreliable rainfall
Lack of collective marketing	Competition from cross border imports
Lack aggregation centres	
Brokers and middlemen determine price	
Inadequate agronomic practices	
Inadequate financial capital for inputs	
Weak policy / political environment for bean production and commercialization	
Weak horizontal and vertical linkages among actors	

Source: Focus group discussion and interviews

generation and dissemination. These strengths and opportunities provide a firm foundation for improving its performance, with special focus on volumes for trade. Results obtained in this case study suggest the following options:

Intensification models. The ranking of formal markets far above the informal ones by farmers in this study, underscores the need to re-structure the bean value chain at four main segments; farm level, service institutions, buyers and policy framework (Table 4), if sufficient volumes have to be produced and supplied to formal buyers; namely processors, retail supermarkets, exporters and importers. Indeed, Jaleta *et al.* (2009) and Minot (2011) argue that, after decades of investments focusing at the production segment of the value chain, there are indeed few successful cases of commercialisation in food staples among small scale farmers. One of the reasons why small scale farmers have not taken off on a commercialisation path is that there has not been a deliberate strategy to identify and work with a homogenous category. In the present study, three categories were evident; namely subsistence-oriented bean farmers (19%), spot-market farmers who produce and only market when there is surplus (70%), and a few market-oriented farmers 11% (Table 5).

About 94% of the farmers grew beans before identifying a buyer (Table 5). The multi-objective nature of smallholder bean farming (Table 5) suggests that markets that are suited for smallholders producing common beans should have a dualistic marketing arrangement in which smallholders will be able not only to spread market risks, but also to reap simultaneously from the benefits provided by both the formal and informal marketing arrangements. The results further suggest that this arrangement should entail greater integration in formal markets, while allowing participation to smaller extent in spot-market transactions which offer immediate cash important for smallholder daily household needs. There is, therefore, need to develop

models to upgrade spot market farmers into market oriented producers, and ultimately shareholders into value chains. AGRA report (2017) on the Status of Africa Agriculture argues that agricultural assistance aimed at commercialising small scale farms needs to target only those farm households which have greater likelihood of market-orientation. Alternative types of assistance should be given to other types of small scale farms, if resources are not to be wasted, or farm households misled into unsustainable livelihood strategies (AGRA, 2017). Thus, the findings of the present study agree with the AGRA report on the need to target homogeneous groups of farmers, with interventions aimed at enhancing marketing. Commercialisation and globalisation of agriculture have opened opportunities to supply products to markets. However, access to these markets has the stringent requirements, which rural producers must re-organise to comply (Dolan and Humphrey, 2004).

To integrate rural smallholders into formal markets, the production segment of the chain must be transformed into a market-facing entity that guarantees quantity, quality, safety, reliability, traceability and governance structures demanded by these markets. Production needs to change from the current practice where most farmers allocate less than 0.4 ha to bean production, usually intercropped, to intensification through pure stand models (Table 5), with increased use of improved technologies (Tadele, 2017). In addition, smallholders need to change from the practice of using grain as seed, to the use of certified seeds and growing high yielding varieties demanded by the market (Tables 3 and 4). Other practices which should be embraced at production include shifting from growing beans before identifying buyers (Table 5) to producing for specific buyers; changing from individual marketing to collective marketing through village aggregation centres; and from spot-market transactions to contract farming (Table 6). Advantages and benefits of contract farming

TABLE 4.   Farmer perceptions on changes needed for producing and supplying sufficient common bean volumes to the market in the major bean producing areas of Kenya

Small scale farmers	Service institutions	Buyers	Policy
Group production and marketing	Dissemination of varieties demanded by market	Reliable institutional buyers (supermarkets, processors, exporters, Food agencies, schools)	National and County government support and Promotion of bean production and trade for incomes, food and nutritional security
Increased acre rage under beans	Technical advice and training of farmers on GAP	Contractual engagement	
Grow common variety	Avail credit for farm priority inputs		
Contract farming			
Common aggregation centre			

Source: Focus group discussion and interviews

TABLE 5. Farm characteristics in the major bean producing areas of Kenya

| Parameter | Description | Lake Basin | | | Lower Eastern | | | |
| | | Homa Bay | | | Makueni | | Machakos | |
		Rangwe % (N=125)	Wiga % (N= 275)	Ndhiwa % (N=55)	Kima Kiu % (N=300)	Kasikeu % (N=200)	Mua % (N=300)	Overall % (N= 1255)
Land allocated for bean production (ha)	< 0.2	60	15	40	5	0	10	22
	0.2-0.4	30	54	60	15	50	80	48
	>0.4	10	31	0	80	50	10	30
Production system	Intercrop	90	77	100	30	30	15	57
	Pure stand	10	23	0	70	70	85	43
Yield (90 kg bags per ha)	Average yield (Intercrop)	6.25	6.25	7.5	7.5	7.5	6.25	7
	Pure stand	-	-	-	17.7	15	10	14
Objective for bean farming	Subsistence only	19.5	15	60	20	0	0	19
	Subsistence + surplus marketing	80	85	40	75	42	100	70
	Marketing	0.5	0	0	5	58	0	11
Proportion of farmers growing beans	After identifying buyer	10	10	0	10	5	0	6
	Before identifying buyer	90	90	100	90	95	100	94

TABLE 6. Common bean marketing arrangements in major bean producing areas of Kenya

| Parameter | Description | Lake Basin | | | Lower Eastern | | | |
| | | Homa Bay | | | Makueni | | Machakos | |
		Rangwe % (N=125)	Wiga % (N= 275)	Ndhiwa % (N=55)	Kima Kiu % (N=300)	Kasikeu % (N=200)	Mua % (N=300)	Overall % (N= 1255)
Contract farming	Linkages to formal markets 1= Yes, 0= No	0	0	0	0	0	0	0
Marketing arrangements	Individual marketing	90	95	100	80	100	100	94
	Group marketing	10	5	0	20	0	0	6
Market outlets	Brokers/ middlemen	70	85	80	65	45	80	71
	Institutions (schools)	5	0	0	30	50	10	16
	Individual consumers	25	15	20	5	5	10	13
Aggregation centre	availability of collection centre 1= Yes, 0= No	0	0	0	0	1	0	0.2
Side selling	When contracted would you sell to informal actors following marginal price increase? 1= Yes, 0= No	1	1	1	1	1	1	1

for smallholders have been demonstrated in several studies (Costales and Catelo, 2009; Poole and Freece, 2010; Prowse, 2012).

To put smallholder bean farmers on a commercialisation path, all the weaknesses identified in the SWOT matrix (Table 3) should be turned into strengths to take advantage of the growing demand. Thus, a theory of change (Taplin *et al.*, 2013) focusing on transforming common bean production into a commercial enterprise, linked to large national buyers and export markets is key to increasing volumes for trade, and can help reduce reliance on imports to meet the growing demand in Kenya.

Market actors: Reliability and price guarantees. Interviews with farmers and extension agents revealed that the biggest challenge faced by farmers producing for formal buyers pertains to difficulties in finding these markets, delayed payments, weak relationships and compliance with high quality standards (Table 2). On the other hand, smallholders easily break contracts with formal markets, through side selling whenever there is a marginal increase in prices (Table 6). To ensure a win-win situation, reliability and stable price guarantees should be the key features of negotiated agreements with formal buyers. By linking with buyers in advance of production, farmers potentially have a more assured market, and often an agreed price, greatly reducing risk for farmers (Njuki *et al.,* 2011). Establishing a strong market institution with double-facing backward linkages to provide farm supply services and; forward linkages responding to consumer needs for quality, safety, product diversity and affordability, will make formal buyers attractive to rural smallholder bean producers. Poku *et al.* (2018) and Barrett (2008), in their review of case studies in Sub Saharan Africa, also suggest that contracts with embedded support services are essential in fostering smallholder market participation and the long-term sustainability of trading relationships.

Market-driven institutional services. Farmers and extension agents identified three institutional issues necessary to support bean market orientation. These are dissemination of bean varieties demanded by the market, technical advice on Good Agricultural Practices (GAP) and credit for priority inputs (Table 4). The first two issues relate to research and extension services, which are public goods aimed at improving the agricultural sector. Institutional failure still limits access to the much needed productivity enhancing services. However, liberalisation policies which swept much of Africa in the 1990s, ought not to be an excuse for institutional voids (Trienekens, 2011). In Kenya, the national and county governments, which are responsible for policy and implementation of agricultural programmes should restructure research and extension into modern, market-driven, globally competitive institutions that respond to the technological needs of smallholder farmers' quest to access formal markets.

Access to credit for farm priority inputs is another area worth special focus. From the interviews, financing is needed by bean farmers to support land preparation and expansion and purchase of seed and fertiliser. With linkages to formal markets, these costs could be recovered from farm sales through interlocked financing arrangements with credit institutions (Barret, 2008).

Business enabling environment. Although bean marketing has a multiplier effect on the socio-economic well-being of rural producers, consumers and the Kenyan national economy, it has not received sufficient policy attention compared to other staple foods such as maize. In pursuit of the national development goals (Government of Kenya, 2008) and key Sustainable Development Goals (United Nations, 2016), which underscore the importance of promoting market-oriented agriculture, an enabling policy and business

environment for marketing should be promoted through affirmative action that compel for instance, learning institutions to accept beans in lieu of cash. Other enablers for promoting bean marketing should include preferential government tenders for small scale farmer organisation while a policy framework that requires aid agencies and food manufacturers to purchase beans directly from farmer organisations would have great impact on rural economic development. Indeed, the Africa Agriculture Status Report (AGRA, 2017) acknowledges that an inclusive agricultural agenda requires that governments support and guide the transformation in the agricultural sector through an enabling economic and policy environment and strengthening of market institutions. Governments must also work with the private sector and non-governmental organisations (NGOs) to undertake targeted interventions to help commercialise many more small scale bean farmers through linkages to reliable and profitable markets.

Thus, the study findings reveal that in the Lake Basin and Lower Eastern Kenya, market arrangements which are suited to small scale bean farmers should have reliability and price guarantees. The results also suggest that in order to enhance the production and supply of sufficient volumes of beans especially to formal market buyers, the following strategies should be adopted by actors in the common bean value chain: the use of intensification models; market driven research research and extension services, appropriate financial credit; and an enabling policy framework and business environment The agenda for further research should entail piloting these changes in an empirical study.

CONCLUSION

This study sought to assess which market arrangements work for rural smallholder farmers in the bean corridors of the Lake Basin and Lower Eastern Kenya. The findings reveal that though spot-market transactions with brokers and traders provides ready cash for the farmers, formal buyers are more reliable, but difficult to find and had rigorous requirements. The multi-objective nature of smallholder bean farming suggests that markets that are suited for small scale farmers producing common beans should have a dualistic market arrangement. The results further suggest that this arrangement should entail greater integration in formal markets, while allowing participation to smaller extent in spot-market transactions which offer immediate cash important for smallholder household needs.

Strategies to integrate smallholders into formal markets to sustainably produce and supply sufficient volumes for trade, should entail a transformation agenda at four levels of the value chain. First, intensification of production through pure stand models; secondly, Stable price guarantees; third, a market- driven research and extension service and; lastly, an enabling political, policy and business environment in the bean value chain. Further research should entail piloting these changes in a case control study.

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