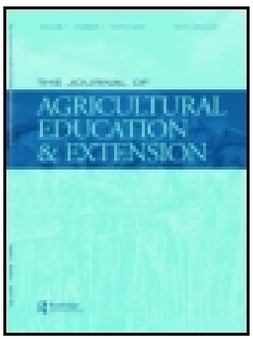

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Emerging advisory service agri-enterprises: a dual perspective on technical and business performance

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ABSTRACT

Purpose: This article addresses the gap in understanding the performance of emerging private agricultural advisory service (AAS) models in developing country contexts, in relation to their dual objectives of supporting farmer-clients and becoming profitable agribusinesses themselves.

Methodology: Multiple case study of Service Providers Enterprises (SPEs), an emerging youth-led agribusiness model offering silage making and other services in the Kenyan dairy sector. Using mixed methods, data were collected through in-depth interviews and focus group discussions, from eight sampled SPEs, 72 farmers, and key informants across four counties.

Findings: The results show SPEs' contribution to some changes in farmers' practices, including improvement in milk production, but with some limitations to optimal technical performance. SPEs' mixed business performance is linked to limited market demand, seasonality, and limited fit of some services offered, highlighting gaps in entrepreneurial and market orientation of such agribusinesses, compounded by a challenging operating environment.

Practical implications: This evidence implies enhancing the contribution of such service agri-enterprises – in transforming agri-food systems and offering employment opportunities especially for youth – requires targeted and sustained policy and program support in business incubation, market development, and strengthening the value proposition to farmer-clients.

Theoretical implications: The dual perspective on performance expands theoretical perspectives for assessing AAS, especially in relation to commercialization. The emphasis is on the mutuality of substantive demand and economic viability of these services, which is reliant on certain market maturity.

Originality: This article is a novel attempt to assess private AAS models from both a technical perspective and regarding their viability as agri-enterprises.

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Introduction

Sustainable agricultural development in sub-Sahara Africa (SSA), like in other developing regions, is imperative as the transformation of food systems is accelerating, driven by population growth, increasing urbanization, and changing dietary patterns. The latter includes increased demand for more nutritious and safe food, i.e. meat, milk, fish, fruits and vegetables. This is coupled with pressures on land, water and other natural resources in agricultural systems that are increasingly confronted with effects of climate-change (Haggblade 2011; McCullough, Pingali, and Stamoulis 2012; Tschirley et al. 2015). One characteristic of these transforming agri-food systems is that they are increasingly knowledge-intensive and technologically dynamic. This requires farmers who are part of this transformation to become more entrepreneurial and seek out the requisite technical and managerial support services to sustainably increase their production and remain competitive (Kilelu, Klerkx, and Leeuwis 2013; Tschirley et al. 2015; van der Lee et al. 2018).

Several scholars note that entrepreneurial approaches need to be included as an integral part of the policy reforms to stimulate African sustainable agricultural development (Haggblade 2011; Ochieng 2007). This is not only at the farm level but also in recognition of additional opportunities in the sector for business and employment creation, including in the provision of technical and business support services to farmers. These are commonly referred to as agricultural advisory services (AAS), and may include extension activities such as demonstration and training. Such services are uniquely positioned to grow into a broad range of agri-enterprises in the context of modernizing agri-food systems on the continent (Haggblade 2011; Kabasa, Kirsten, and Minde 2015; Lunguli and Namusonge 2015).

Globally, the delivery of AAS has evolved and continues to be a key instrument for enhancing livelihoods and supporting agricultural innovation, natural resource management, and rural development (Faure, Desjeux, and Gasselin 2012; Kabir, Knierim, and Chowdhury 2020; Kilelu et al. 2011; Labarthe and Laurent 2013; Ragasa et al. 2016). These services are integral to the agricultural innovation system, as they seek to offer innovation support to farmers by enabling access to information on new technologies, inputs, effective and sustainable farming practices, and management options, and moreover provide broader system innovation intermediary functions (Faure, Desjeux, and Gasselin 2012; Kilelu, Klerkx, and Leeuwis 2013; Koutsouris and Zarokosta 2020). The once dominant public-supported extension and input services have progressively been replaced by pluralistic AAS. This means there is a diversity of actors – including public, private and civil-society organizations – that provide a range of services to farmers and are potentially more responsive to their needs. The structure and organization of AAS delivery varies across countries and regions. While private sector led, fee-based advisory service models have been operational longer in developed countries (Klerkx, De Grip, and Leeuwis 2006; Labarthe and Laurent 2013; Prager et al. 2016), they are now emerging in SSA countries, where policy shifts are encouraging a central role of the private sector in driving agri-food sector transformation (Bebe, Gowland, and Nicholas 2016; Birner et al. 2009; Chowa, Garforth, and Cardey 2013; Kilelu et al. 2011). The Kenyan dairy sector provides examples of private sector delivery models that have emerged triggered by increased farmer's demand for more external inputs

and services as they seek to exploit expanding market opportunities. This is supported by a policy context that is repositioning the sector toward commercial competitiveness and sustainable development (Bebe, Gowland, and Nicholas 2016; Kilelu, Klerkx, and Leeuwis 2013; van der Lee et al. 2018).

Studies argue that in many developing countries, and in SSA in particular, demand-driven private advisory services have the potential to fill the gaps of limited public extension support and to enhance the cost-effectiveness and quality of service delivery (Babu and Zhou 2015; Kilelu et al. 2011; Poulton, Dorward, and Kydd 2010). Furthermore, Anderson and Feder (2003) contend that efficiency gains of AAS can especially come from locally decentralized delivery systems with an incentive structure largely based on private provision. Engaging youth in providing such services is noted to offer opportunities for enlisting them in the agri-food sector and hence has become an important policy goal at regional and national levels (Filmer and Fox 2014; Franzel et al. 2020; MoALF 2017). It ties in to what some scholars have projected as growth in demand for skills, related to on-farm (e.g. extension and advisory support; farm management) or post-farm services (e.g. processing, logistics, food safety etc.), in so-called 'food system professions' (Kabasa, Kirsten, and Minde 2015) in transforming agri-food sectors in SSA.

To understand the consequences of privatization of AAS, some studies have looked into their performance from a technical dimension, i.e. the effects of these services on farm-level outcomes. Coming mainly from developed countries, and a few from developing countries, these studies have shown mixed results regarding the effectiveness of these services in supporting production efficiency and sustainability outcomes, in some cases coupled with enhancing decision making and managerial skills at farm level (Babu and Zhou 2015; Bebe, Gowland, and Nicholas 2016; Clark 2009; Dinar, Karagiannis, and Tzouvelekas 2007; Klerkx, De Grip, and Leeuwis 2006; Labarthe and Laurent 2013). However, the performance of such service agribusinesses in terms of their business viability remains less understood. Moreover, the dual objectives of private sector delivered AAS, in terms of their technical performance toward farmers and business performance in relation to their viability, have not been investigated and remain weakly conceptualized. This paper seeks to fill this knowledge gap through an exploratory case study of the youth-led Service Providers Enterprise (SPE) model in the dairy value chain in Kenya. The main research question guiding the study is: 'how do emerging private service delivery agri-enterprises perform in providing support to farm enterprises and as a business in themselves?'

The next section of the paper reviews relevant literature to develop a conceptual framework with a dual lens for analyzing the performance of emerging service agri-enterprises. We then introduce the case study. This is followed by a methodology section, then the presentation of results and discussions. The final section concludes with implications and recommendations.

Literature review

Understanding performance of emerging service agri-enterprises

In this section, we expound on the analytical framework for an exploratory assessment of the dual dimensions of the performance of service agri-enterprises – technical and

business performance. These agri-enterprises operate in a particular policy and market context that has a bearing on their performance. We emphasize that integrated approaches need to be applied in assessing the performance of emerging agri-service business models that provide AAS.

Technical performance dimension of service agri-enterprises: impact on client

As agri-enterprises, private AAS provides a broad range of innovation support services, aimed at enhancing farm-level technical and managerial practices, to enable sustainable and profitable production and marketing, and ultimately contribute to livelihoods of farm households (Kilelu, Klerkx, and Leeuwis 2013; Koutsouris and Zarokosta 2020; van der Lee et al. 2018). Such service agri-enterprises can be considered knowledge-intensive businesses (Hertog 2000), through which the service provider and client enter into a relation, with the explicit goal to offer services to induce certain positive changes.

According to Prager et al. (2016), the technical performance of service agri-enterprises can be analyzed from a technical and a functional quality perspective. Technical quality is reflected by the actual changes induced by the services delivered (e.g. changes in farm skills and practices leading to increase in results, such as yields). Functional quality focuses more on the quality of service delivery, e.g. client-service provider interactions, client satisfaction, trust. A focus on functional quality is seen as necessary especially for 'intangible' farm advisory services, for which technical quality can sometimes be difficult to capture, as it requires more experimental methodologies to assess these changes. The functional quality can also relate to what are broadly considered as innovation support services such as demand articulation, institutional strengthening and network facilitation and brokerage. Some of these services are targeted at optimizing or transforming systems beyond individual farm level (Faure et al. 2019; Kilelu et al. 2011; Klerkx et al. 2017). The emphasis on both technical and functional quality of service remains of interest as this has a bearing on the outcome of such services in relation to the value they offer to their clients. This is a key in the context of policy and market shifts emphasizing farms as enterprises.

Assessment of these different technical dimensions of AAS is emphasized again by Birner et al. (2009), who developed a multidimensional framework for analyzing the performance of pluralistic AAS systems. In this framework, the service provider is accountable at two levels. First, in terms of the quality of service provided, including content, targeting, timeliness, feedback, relevance, effectiveness, and efficiency. Second, in terms of the changes induced at farm level, including in decision-making capacity, adoption of innovations, and changes in practices (production, management, marketing etc.). Aspects of this framework have been applied to understand the performance of public and pluralistic AAS delivery systems in some developing countries (Kabir, Knierim, and Chowdhury 2020; Ragasa et al. 2016). Similarly, Labarthe (2005) states that technical performance has a number of dimensions. Those of particular relevance include the technical dimension that refers to the yield gains related to the service; the innovative dimension that relates to the development of new products and tools to deliver the service; and the relational dimension that is concerned with personalization and intensity of services, including managerial support (e.g. farm information management and analysis and entrepreneurial support). However, it seems that aspects related to the role of advisory

services in providing managerial and business support have received limited attention in literature (Hilkens et al. 2018). Clark (2009) has demonstrated that the effectiveness of service agri-enterprises can be assessed by looking at their technical performance, i.e. how they support the technical and management skills of farmers.

Thus, literature provides guidance on assessing the technical performance of AAS by looking at how responsive the services are in reaching various farmer-clients and in addressing their technical challenges and needs. Delivery of services and related inputs ideally integrates decision support and learning at farm level as part of building a farmer's capacity to innovate and manage the enterprise. This ultimately contributes to impact level changes, such as enhanced productivity, income, and an optimized and sustainable farming enterprise, which in turn leads to the strengthening of agri-food value chains.

Business performance dimensions of service agri-enterprises

A business or enterprise is characterized as a bundle of internal and external resources that enable the venture to become competitive (Penrose 1959 cited in Lunguli and Namusonge 2015). The viability of an enterprise is dependent on how well it is capable of stimulating demand and articulating value for customers and growing its market to generate income and profitability. These capabilities relate to the concept of entrepreneurship, which has gained traction in literature in the agriculture sector and is defined as the identification, assessment and pursuit of business opportunities that occur along agricultural value chains (Lans, Seuneke, and Klerkx 2013). Many studies on agricultural entrepreneurship tend to focus on the farm level, with a view of the farm as enterprise and the farmer as entrepreneur (Bebe, Gowland, and Nicholas 2016; Clark 2009; Filmer and Fox 2014; Meuwissen et al. 2019; Seuneke, Lans, and Wiskerke 2013), but the concept equally applies to other actors and enterprises along the agri-food value chain.

Understanding how a business is performing is linked to how they develop and enhance their prospects, which is commonly assessed using financial and non-financial measures. The financial measures typically look at sales, net income, profitability, market share, and return on investment (Boso, Story, and Cadogan 2013). Literature argues that successful business execution or performance can be explained by competencies, attitudes, and skills demonstrated by the entrepreneur. Together these have been characterized as entrepreneurial orientation, which is viewed as the proclivity of a business to explore opportunities in a market and grow the demand and income. The characteristics of entrepreneurial orientation are demonstrated in a business's innovativeness, risk-taking, pro-activeness and competitiveness as they seek out opportunities in a market (Boso, Story, and Cadogan 2013; Lindsay et al. 2014; Verhees, Kuipers, and Klopcic 2011). Further, Boso, Story, and Cadogan (2013) note that complementary to entrepreneurial orientation there is market orientation, which is the implementation of marketing or the market-oriented operations of the business. This is characterized by how the business creates market opportunities through developing new services and products. Thus, the degree of entrepreneurial and market orientation is a reflection of a business's strategic positioning. This is widely recognized as impacting on its performance, although as Wiklund and Shepherd (2005) note, the relationship is complex and usually is affected by the specific context.

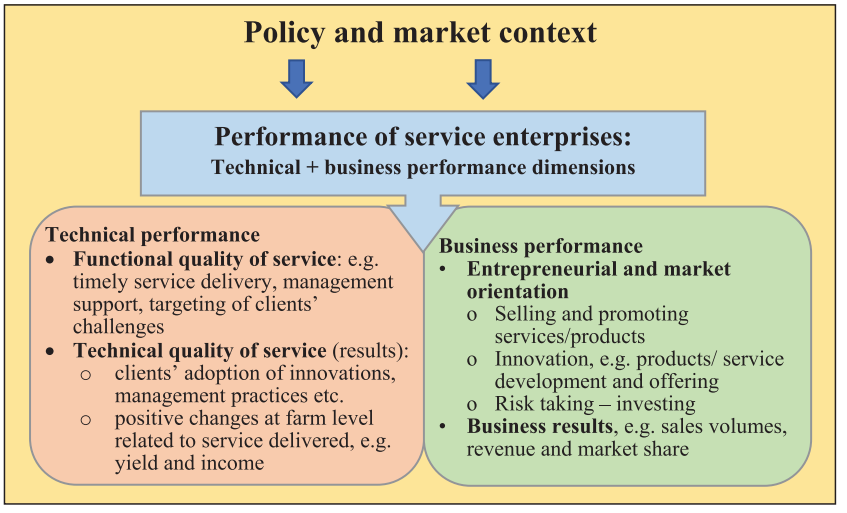

Figure 1. Analytical framework to assess technical and business performance of service agri-enterprises within the Kenyan dairy policy and market context (Source: authors' elaboration).

These perspectives have been applied to understand the performance of enterprises in developing and emerging economies (Boso, Story, and Cadogan 2013; Bruton, Ketchen, and Duane Ireland 2013; Lindsay et al. 2014). In these economies, entrepreneurship is increasingly noted as important for stimulating inclusive economic development and as a solution to employment creation and reducing poverty. Here, businesses operate in a context with weak demand and institutional uncertainty (Boso, Story, and Cadogan 2013; Lindsay et al. 2014). This is clearly noted in the agricultural sector, where prospects for agribusiness, including service delivery, are growing. As such, entrepreneurial capabilities for growing a market – by stimulating what is considered latent demand for commercial agri-services into effective demand and by articulating value for customers – are important for generating income and achieving profitability in the context of developing economies (Haggblade 2011; Poulton, Dorward, and Kydd 2010; Bebe, Gowland, and Nicholas 2016).

Following the exploration of literature above, Figure 1 summarizes the analytical framework that is applied to examine the dual dimensions of technical and business performance of SPEs as agri-enterprises within the Kenyan policy and market context for dairy.

Methodology

Case description: the SPE model

The SPE model is characterized as a group-centered enterprise of mainly post-school rural youth, who offer agricultural advisory, support services, and inputs to farmers in their locality on a commercial basis. The SPEs are embedded within vibrant dairy value chains in target regions in Kenya where small- and medium-scale farmers are engaging in market-oriented production and are demanding various contracting and advisory support services. The main service entry point for the SPEs is contracted silage making

services. The model was initiated in 2010 with the support of Netherlands Development Organization's (SNV) dairy program (SNV 2013), starting with four SPEs located in Nyandarua, Nyeri and Embu counties. SNV's Kenya Market-led Dairy Program (KMDP, 2012–2019), funded by the Embassy of the Kingdom of the Netherlands in Nairobi, scaled up the concept by establishing more SPEs in Meru, Baringo and Uasin Gishu counties. As such, while designed to address farmer-identified constraints, the model design can be considered as a top-down intervention. During establishment of the SPE groups, all recruited members went through a short practical training on silage making, forage establishment, basic dairy cow management and business skills. The SPEs were then linked to dairy farmers' cooperative societies (DFCSs) in their localities as the entry point for reaching potential farmer-clients. SPE teams became the next-door solution for forage preservation, forage establishment, dairy management advice, as well as the supply of forage seeds and silage preservation materials.

Underpinning the SPE model are several conceptual building blocks, summarized as:

(i) The model requires a vibrant sector in which to anchor service delivery. The assumption is that farmers in economically vibrant agricultural sectors will be willing to pay for services that support the growth of their enterprises.
(ii) The service providers are equipped with practical skills that are tailored to needs in the sector and can generate demand.
(iii) The enterprise members may offer some services as a group, especially in silage making, which requires group work.
(iv) The service providers need to continually improve their competencies and develop new services that are offered competitively to their (would-be) clientele.

Case selection

The study used a multiple case study design (Yin 2009). The study was conducted in four counties that were randomly selected out of the six counties where SPEs have been established, i.e. Meru, Nyeri, Nyandarua and Baringo. Eight out of fifteen operational SPEs that were formed between 2010 and 2015 were selected. Three SPEs were randomly selected in Meru County, two in Nyandarua County and one in Nyeri County. In Baringo, two out of five SPEs were purposively selected in consideration of the distances between them, in order to reduce travel time. Data were collected between June and July 2017. Figure 2 provides an overview of the selected SPEs and the DFCSs they were linked with.

Data collection and analysis

To illuminate the cases in detail and to triangulate findings, data were collected using mixed methods (Table 1). SPE representatives were interviewed using an open-ended questionnaire to collect information about their group members, service delivery, and business performance. Two SPE representatives were interviewed from each of the SPE groups, except for Unique SPE (Figure 2) where only one representative was interviewed. The data collected had some gaps regarding enterprise results, as many SPEs did not have consistent business records.

Figure 2. Map of Kenya with locations of sampled SPEs in four counties, in brackets are the Dairy Farmers Cooperative Societies they are linked to.

Table 1. Overview of data collection methods used and types of data collected.

Methods	Sample size	Focus
SPE open-ended questionnaire	8 SPEs, 2 reps/SPE	Information on group membership, types of services delivered, and business performance
Focus group discussions	±9 farmer-clients per SPE	Mix of quantitative individual farm-level data on dairy production and qualitative data about views on SPE contribution to on-farm changes and on quality of the services
DFCS key informant interviews	Representatives of 8 DFCSs	Contribution of SPEs to changes in members' farming outcomes from DFCS perspective.

To collect data from farmers, focus group discussions (FGDs) were held with farmers that were clients to the sampled SPEs. A total of 72 farmers participated in the FGDs. The FGDs were designed to collect a mix of quantitative individual farm-level data and qualitative information about farmers' views on issues related to feeding constraints, the SPE's

contribution to their on-farm changes, satisfaction with and challenges related to the SPE services. The level of detailed farm-level data was limited to changes in feed preservation practices with support of SPEs, and in milk production and marketing linked to the use of SPE services. The choice to use the FGD to collect individual farm-level data was considered time saving for farmers by avoiding two data collection sessions. Key informant interviews were conducted with representatives of DFCSs whose members were SPE clients, to broaden perspectives on the contribution of SPEs to changes in dairy farms that access SPE services.

Descriptive analysis of the quantitative data was conducted using SPSS and the qualitative data was transcribed, coded and analyzed in Excel.

Results

Characteristics of sampled SPEs and their services

The eight SPEs offered services to members of the linked DFCSs. Of 74 youth originally recruited and trained, 32 remained active in the SPE groups. Seventeen of these 32 current members were characterized as youth, defined as 18–35 years old. Of these, 30 were male and two female. Some of them came from farm families. Regarding education levels, one member had acquired basic education only (primary level), while 19 had attained up to secondary school education, and twelve had attended (some) additional post-secondary training. During the study, the SPEs had an average of four active members in each group, although at the time of establishment the groups had recruited more members.

The main service offered by SPEs was silage making. This was the initial value proposition, which targeted addressing seasonal fodder shortage as a key limitation in dairy farming in Kenya. The silage making services included harvesting, chopping, compacting, tubing, and (sometimes) provision of the materials required for ensiling. In addition, all SPEs have expanded their service packages to include complementary services to silage making, i.e. forage establishment, farmer (group) training, and input supply (e.g. forage seeds, silage making materials) (Figure 3). Most SPEs provided farm-level advice related

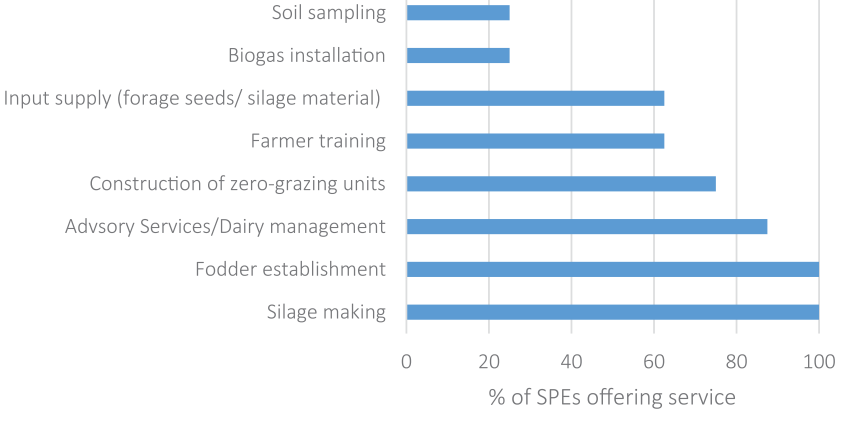

Figure 3. Types of services offered by SPEs ($n = 8$).

to animal husbandry (e.g. calf rearing, breeding, record keeping). A few SPEs provided soil sampling, barn construction, and biogas installation as additional services. Farmers in the FGDs noted that silage making and forage establishment were the main services they sought from SPEs. On forage establishment, farmers interviewed wanted support with planting and advice on good forage management (e.g. fertilization, weeding and spraying). They sought advice from SPE members as public extension services were no longer available.

Technical performance of SPEs

Technical performance was analyzed from the dimension of functional and technical quality of the services.

Functional quality of service

According to the FGDs, farmers noted that access to fodder and good feeding management were among their main challenges. SPEs' targeted support services enabled them to integrate silage in their farms and provided other support to improve fodder access and other improved feed management practices noted in Figure 3 as solutions to these challenges. Many farmers had not made silage before, but with SPE support, silage making became a common practice in their localities, which shows that the services were well-targeted. The silage was made from maize, Napier grass, sorghum, or oats. Maize silage was most common, with an estimated 9415 tonnes made in 2016 (about 83% of total silage made).

All farmers in the FDGs indicated that they have used silage making services at least once a year, with a few farmers using these services more than once a year. Use of SPE silage making services was most frequent among Mbwinjeru Ariithi DFCS clients, where the majority (75%) of clients used Bidii's service more than once. In Kiunyu DFCS, farmers said they had conserved silage in the past, but current (2017) drought conditions affected maize production for silage. Data from the eight SPEs indicated that in 2016, the groups collectively made about 11,269 tonnes of silage (Figure 4). Two out of three SPEs in Meru County made the highest volumes – over 3000 tonnes – suggesting effective service delivery compared to others. Half of the SPEs produced only one-sixth of that amount, especially the two in Baringo County. The average amount of silage made varied widely, from 4 to 66 tonnes per farm (1 tonne feeds one cow for ca. 2 months). Farmers indicated that the silage made was insufficient to last the entire dry season.

To integrate silage in their dairy enterprises, farmers indicated the need to make investments, such as purchasing equipment (including chaff cutters, choppers, polyethylene wrappers, and molasses), construction of bunkers, and allocation of farmland. Some farmers allocated part of their own land to grow forage, while others leased land for planting forage crops. The equipment (in some cases provided by SPEs), labor, and technical support were important elements of the service, as silage making is labor intensive and requires technical acumen to ensure quality.

Technical quality: improved farm-level results linked to SPEs

Increase in milk production was an important indicator of positive technical performance, as dairy farming was the primary source of income for most farmers involved in

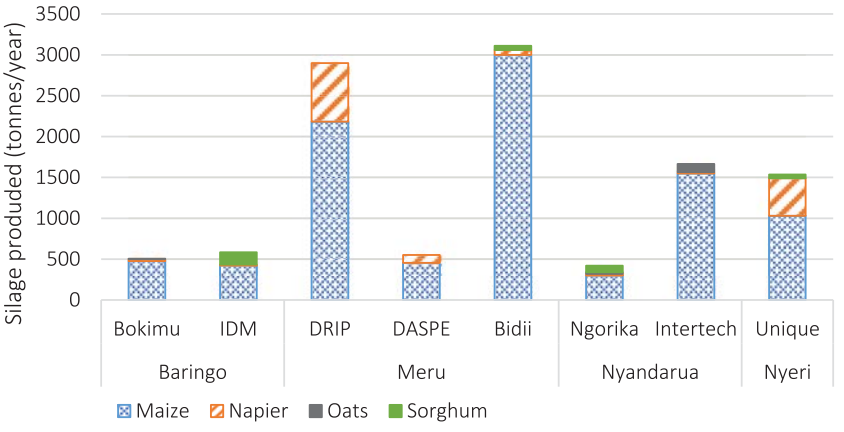

Figure 4. Volumes of silage made by the SPEs across four counties in 2016.

the study, with only a few indicating having off-farm income sources. In the FGDs, some farmers mentioned that milk production increased when they started to adopt silage through SPEs. The interviewed farmers in Meru, where SPEs made the most silage, indicated that their average production had gone up to about 9.5 litres/cow/day for those in Naari and Nkuene DFCS and to about 8 litres/cow/day for those in Mbwinjeru Ariithi DFCS. While there was no baseline data on productivity before SPE services, the milk yield in the high dairy producing regions in Kenya, such as Meru County, averages 5–8 litres/cow/day for wet and dry seasons combined. Therefore, farmers' own reporting suggests a productivity increase linked to uptake of silage and other good feeding practices introduced through the SPEs, but in absence of a baseline, a selection bias of mainly capable farmers with higher than average yield levels engaging SPEs cannot be ruled out. In addition to increased productivity farmers mentioned other benefits resulting from integrating forage production and preservation in their farms. These were: stable production even during dry seasons, better animal health, lower production costs through reduced purchase of dairy meal, and increased fertility rates.

From the group discussions, it was estimated that farmers from Nkuene DFCS generated the highest gross revenue from milk at about KES 1779 (1 USD ~ 100 KES) per day, while farmers in Mumberes DFCS had the lowest gross revenue of about KES 264 per day.

Challenges affecting technical performance of SPEs

The SPEs faced several challenges that limit their operations and their ability to effectively provide services to their clients in terms of technical and functional quality. The noted limitations facing the SPEs included lack of appropriate machinery and limitations in access to inputs, i.e. poor quality of ensiling material and quality and volumes of forage seed. During discussions, farmers noted some skill gaps in SPEs in relation to additional services they needed (e.g. artificial insemination and animal health care). Furthermore, some farmers indicated that during peak silage making season, there was a high demand for services but there were not enough SPEs available, affecting timely delivery of services.

Business performance of SPEs

This section analyses the performance of SPEs as a business through understanding market- and entrepreneurial orientation as well as business results.

SPE entrepreneurial and market orientation

SPEs have adopted a hybrid business approach, offering services both as a group and as individual members. The group services are offered especially where there is a need for higher labor input, such as forage planting, harvesting, and silage making. While SPEs started with silage making and forage establishment services, most expanded their service offer with new services and products (Figure 3). Expanding the service offer was said to be important, especially because silage making is seasonal. However, the SPE members noted that demand for some additional services remained relatively low (e.g. soil testing, barn construction, and biogas installation). Thus, it is a key for SPEs to not only diversify services but also to be able to create market demand for these services. The results show that Unique SPE was able to create demand for the largest number of services (Figure 5), while DRIP and IDM SPEs had the least services demanded.

As emerging entrepreneurs, SPEs promoted their services through various channels, such as dairy field days and agricultural fairs (exhibitions) organized by various actors at DFCS, county and national level. DFCS-facilitated forums were identified as a good marketing option. Word-of-mouth marketing by early adopters connected SPEs to new clients as well. Such referrals from clients and related social networks were the most common means of acquiring new clients.

To be effective in service delivery, some SPEs made various investments. The main investments highlighted were the purchase of efficient chaff cutters and chopping machinery by Unique, Intertech and Bidii SPEs. Financing of these investments came mainly from their own savings and some from bank loans. Bidii acquired more assignments for silage making in 2016 after it invested ca. USD 1650 in efficient choppers. In this case, SNV provided financial support through a cost-sharing arrangement to acquire their first chopper, with SNV matching a bank loan. However, we conclude that most

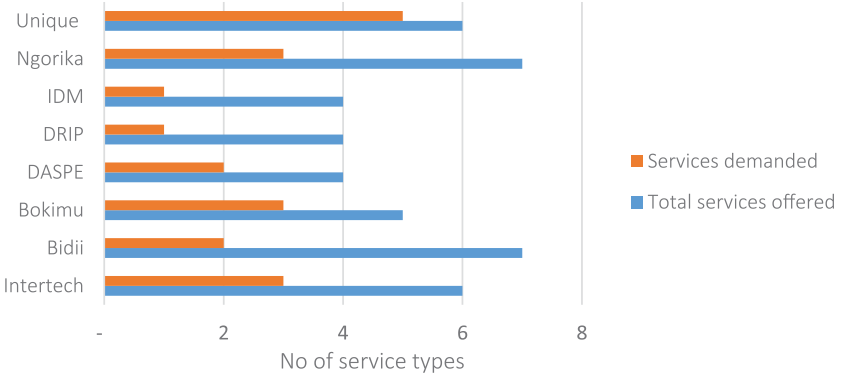

Figure 5. Overview of SPEs services uptake.

SPEs showed low levels of investment in relevant technology in order to enhance their business.

SPE business results

As noted in the preceding section, the SPEs offer a bundle of technical services to their farmer client base in the respective DFCSs. Based on SPE services and products uptake in 2016, the business results varied. However, a caveat to this analysis is that many SPEs did not keep proper financial transactions records, posing a challenge in robust analysis of business performance. This is why we used turnover as a proxy of income. The turnover came mainly from silage making, some advisory services, and sale of inputs. Silage making services made the highest contribution to earnings. The fees ranged from KES 250–1000/tonne. In some cases, the price was set by the cooperative. For example, Naari DFCS set silage making fees at KES 2000 per lot, irrespective of the amount of silage made, as they had invested in choppers that they rented out to the members. Another key revenue stream for some SPEs was the sale of inputs, mainly forage seeds. While SPEs conducted many training events, most of these were promotional activities to market services. This free training included silage making demonstrations. In some cases, the SPEs were brought in to conduct training through third parties such as dairy development projects (including SNV-KMDP). Rather than being paid commercially, the SPEs received a token honorarium to cover their transport costs and printing of training material.

The results show that Unique and Intertech had the highest monthly business turnover of USD 465 and USD 369 per member, respectively; this included about USD 77 and USD 47, respectively, from selling forage seeds and other inputs. On the other end, SPEs such as DRIP and IDM had an average monthly turnover of about USD 53 and USD 73 per member. This shows that there is a link between market demand for diverse services and its effect on turnover, and ultimately on income. The SPEs that marketed most services, i.e. Unique and Intertech, also had chances of making the most income. The 14,227 active suppliers in the DFCSs that SPEs were serving can be regarded as their potential client base. At the time of the study, the SPEs had provided services to about 7% of this client base, an indication of low market penetration. SPEs observed that growing their customer base takes time. Together with the noted seasonality of the main service offered (silage making), this explains the limited incomes of the SPEs.

Challenges affecting business performance of SPEs

As a new model in dairy service provision, SPEs members indicated that they face several business challenges. For most SPEs interviewed, timely payment for their services was the main challenge, as they faced delays and defaulting from clients. This is because some of the farmers take an informal approach to the SPE business, viewing local youth as promoting community welfare rather than offering a commercial service. Costing of services was another issue. SPEs noted that they didn't know how to best price their services to ensure that it was profitable but also reasonable for their clients. Other challenges were intertwined with the constraints of clients, including small land sizes for growing forage, low adoption of technologies and practices promoted, and drought and seasonality that affected demand for services. Dropout of SPE members after recruitment into the SPEs resulted in high attrition in the different groups, ranging from 20% to

85%. This affected some groups' ability to offer services in a timely manner, especially during the peak silage making season.

Discussion

Reflections on technical and business performance of SPEs

This study on SPEs illustrated the growing opportunities for new models of service agri-enterprises in Kenya. From the technical performance dimension, findings showed that SPE services contributed to enhancing forage preservation through silage making, although they faced challenges and limitations in adequately delivering services to their target clients. The findings suggested some closing of the feed- and milk seasonality gap and productivity improvement for part of the farmers receiving SPE services. Calculating gross margins would offer a better understanding of the profit from dairy in the farms involved. However, this would require detailed data on the cost of production, which was not collected in this study.

Another study on the same model (Ndambi et al. 2020), showed similar results, where farmers using SPE services reported improved forage availability, reduced fluctuation in milk production across seasons, and increased milk yields and margins. However, insufficiency of silage to adequately address feed deficits indicates limitations with the functional quality aspects of the services. The SPEs did not offer comprehensive management support to clients, which would lead to clients understanding of how much silage they would need for their cows in each season (feed planning) and to use this to guide silage making and other feed management strategies. Hence, higher impacts on productivity, by combining forage conservation with advice on feed ration formulation and feed planning, were not achieved.

While these results suggest that enhanced use of silage and improved feeding management helped stabilize milk production across dry and rainy seasons, a more conclusive understanding of these effects requires more robust and longitudinal data collection, which was not available for this study.

Moreover, variations existed among SPE technical performance for different farms and regions, owing to factors such as agro-ecological differences and socioeconomic status of the target clients. Other studies on private service delivery models in the Kenyan dairy sector point to similar mixed results, noting that while more farmers accessed services when new providers emerged, this did not necessarily translate into improved farm results (Bebe, Gowland, and Nicholas 2016; Kilelu, Klerkx, and Leeuwis 2013). These findings confirm Clark (2009)'s argument that AAS' effectiveness should be geared toward addressing both technological and managerial gaps in farming. For example, SPEs would be more effective in their support if they integrated forage production and conservation services with decision support on feed planning and management. Furthermore, the findings suggest that the SPE model was not designed to offer broader innovation support services, as argued by scholars that see advisory services taking on innovation intermediation functions as part of system-level agri-food system transformation (Faure et al. 2019; Kilelu et al. 2011).

From the business performance dimension, the results showed that most SPEs have not reached full potential. SPEs offer a range of services, but with limited uptake by a

small portion of their potential client base. Thus, many SPEs were not able to stimulate effective market demand to offer consistent income or fulltime employment to their members. This suggests that most SPEs have limited entrepreneurial and market orientation, although it is as yet unclear what proportion of smallholder suppliers is willing to pay for private services. An important factor for the low market penetration noted was the seasonality of their main service of silage making, without complementary effective demand for other services (Poulton, Dorward, and Kydd 2010). In addition to low demand, other business challenges reflect the difficult operational context of SPEs, including delayed or defaulted payments, poor access to capital to make the necessary investments, and clients' attitude toward them as offering community services. As Boso, Story, and Cadogan (2013) note, the need to enhance entrepreneurial and market orientation is especially important in developing economy contexts, which have underdeveloped markets and a largely informal institutional context, constituting a high-risk business climate.

Implications of the dual perspective in organization of privatized AAS

The application of the dual perspective in assessing SPEs, from a technical and business performance angle, illuminates new insights in the debate on privatization of AAS, particularly in developing countries. The limited market power of smallholders and dominance of informal market systems creates a challenging business environment for private advisory and input service providers, with a lack of consistent and effective demand for their services. This affects business results (turnover and profitability) and makes it challenging for private sector actors, especially small enterprises, to invest (Poulton, Dorward, and Kydd 2010; Bebe, Gowland, and Nicholas 2016). For such emerging services it is important to understand how best to stimulate and sustain service demand and increase the share of paid-for services, which has been referred to as a commercialization gradient (Prager et al. 2016). This raises questions regarding market development for such services in the context of predominant smallholder production systems and implies that more effort is needed to simultaneously stimulate the supply and demand sides of such emerging markets.

The difficulties encountered by the SPEs are also indicative of limitations in the training and deployment of the model, which focused mainly on the technical aspects of service delivery and less on business aspects, such as the entrepreneurial and market orientation skills needed to grow the agri-enterprises. Effectively addressing these gaps requires consideration for the development of more comprehensive private AAS models, which may be beyond the SPE model, which was designed to deploy limited hands-on advisory support on the improvement of feed availability and dairy management.

The limitations in technical performance of the model point to some competence gaps, which imply that the SPEs face resource constraints to continually invest in updating their capacities to offer more service value to their clients. Upgrading skills of advisors is noted as one important avenue for maintaining relevance and growing AAS agri-enterprises (Labarthe and Laurent 2013). Limited technical performance is further compounded in a context where farmers are unable to clearly articulate demand and to hold service providers accountable for the technical quality of their services (Birner et al. 2009; Labarthe 2005; Poulton, Dorward, and Kydd 2010). Thus, to capture the

potential of the emerging private AAS, such as SPEs, there is need to ensure that the service providers are oriented toward a 'best fit' (Birner et al. 2009) of both technical performance toward clients and their own business performance. Both dimensions are important considerations when developing policies to promote private sector services that are technically robust, to ensure their accountability and responsiveness to clients but also factoring in entrepreneurial skills. These are needed for the dynamic and challenging operational context and enabling environment in which these business are embedded (Boso, Story, and Cadogan 2013; Poulton, Dorward, and Kydd 2010; Wiklund and Shepherd 2005), especially in developing countries that may not have attained a certain market maturity for private sector delivered AAS. This links to debates on the need to look at 'advisory subsystems' (Klerkx et al. 2017), as some sectors or groups of farmers may be viably served by private AAS, while others may need continued public support. Furthermore, the effectiveness of service providers can be enhanced when they are embedded within networks of plural actors, providing complementary services that offer a suite of solutions for a broad range of issues to fit the demands of diverse farmer-clients (Birner et al. 2009; Klerkx et al. 2017).

Another interesting point relates to the fact that the majority of SPE members were youth and male. The SPEs emerged from a development program intervention that provided practical, vocational training to skill agri-service providers and stimulate a new business model. Such interventions are noted to be important for enabling easy entry for youth into agribusiness, in line with the entrepreneurial shift that is strongly promoted as part of the agri-food sector transformation in SSA (Birner et al. 2009; FAO, CTA, and IFAD 2014; Franzel et al. 2020; Haggblade 2011). The mixed performance of SPEs calls for reflection on whether and how development and policy interventions for enlisting youth in the agri-food sector offer viable employment and livelihood options and equally contribute to agri-food sector innovation and development (Filmer and Fox 2014; Franzel et al. 2020; Kabasa, Kirsten, and Minde 2015; Sumberg and Hunt 2019; Tschirley et al. 2015). Results suggest that some SPEs exhibited more entrepreneurial and market orientation than others, implying that promoting program-induced entrepreneurship models need to consider the aspirations and motivations of different youth, and recognize that not all youth are necessarily innovative and enterprising (Mgumia 2017; Sumberg and Hunt 2019). Such understanding can guide in the design and promotion of entrepreneurial models that can attract youth with aspirations, who see real opportunities in agri-enterprise, and who will stay involved beyond initial program support.

Conclusions

The study has provided insights into the technical and business performance of emerging agri-service enterprises in the context of transforming agri-value chains and food systems in SSA. The SPE model that emerged in the context of a growing commercial dairy sector in Kenya demonstrates opportunities for service agri-enterprises, even when targeting smallholders. The bundle of services that SPEs offer has the potential to provide innovation support to entrepreneurial farmers and contribute to sustainable growth of the sector. Nonetheless, the mixed results of SPEs indicate that while services are gaining some headway, the model is insufficiently robust. A number of technical and business

challenges are affecting its performance – limitations in entrepreneurial and market orientation and skill levels of the SPE members, in farmers' willingness to pay for services, and in the fit of some of the services to client' needs, in a context of weak effective demand and limited business support. A strong value proposition for the SPE model can be demonstrated when these challenges are addressed. Beyond this single model focused on farm-level support, it is important to interrogate other private advisory business models emerging in the policy context of promoting pluralistic AAS configurations that are well fitted in such emerging markets, paying attention to the kind of 'push and pull' measures needed to strengthen their dual performance. These areas warrant further research on these business models and on the range of innovation support functions they perform.

By design, the SPE was intended as an inclusive business model that would attract youth (male and female) into service agribusiness opportunities, especially in recognition that their role in the sector has declined. The insights of the study show that providing rural youth with appropriate skills, as increasingly promoted through policy and development programs, is an important strategy to attract them to agribusiness and employment opportunities, but requires more varied institutional and gender-sensitive support. The study also pointed to some assumptions on policy push in promoting youth and agri-entrepreneurship. There is limited understanding of youths' aspirations, entrepreneurial characteristics, and limitations they face in enlisting more meaningfully in agri-entrepreneurship, as well on how this can guide the design of specific policy instruments that are more supportive. This suggests the need for further research in this area.

All in all, the study points to the need for public, private, and development sector interventions to rethink how to promote effective private AAS delivery and support their growth as small service agri-enterprises in the sector. A balanced approach is needed in inducing business models through a top-down approach and nurturing those that may emerge from the bottom-up. Sustained support should be embedded in policy decisions that consider more holistically the challenges of inclusive agricultural transformation, rural development and unemployment, vis-à-vis the need to support the growth of agri-enterprises that offer viable livelihood opportunities. Current policies promoting youth involvement in agribusiness need to address both technical and entrepreneurial skills, and provide a conducive enabling environment regarding business development support. Policy instruments need to focus on measures for maturing the market for such AAS services, considering the constraints in the context.

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