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## Constraints to the sustainability of a ‘systematised’ approach to livestock marketing amongst smallholder cattle producers in South Africa

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### ABSTRACT

Commercialization of smallholder agriculture in South Africa is underpinned by reforms to improve livestock off-take in communal areas and engage smallholder farmers with formal markets. To achieve this, Custom Feeding Programmes (CFPs) were established to improve the condition of communal cattle prior to their sale into formal markets and to ‘systematise’ the informal marketing of cattle in communal areas by enabling participants to achieve higher informal market prices. We evaluate the sustainability of eight CFPs located in Eastern Cape Province in terms of their ability to add value to smallholder cattle production and encourage market participation. Communities with CFPs achieved a 16.6% mean cattle off-take rate, substantially higher than in most communal systems. Furthermore, cattle sold through CFPs attained a 17% higher mean selling price than those sold through other marketing channels. However, these benefits were mainly realized by better-off farmers with larger cattle herds and greater ability to transport animals to and from CFPs. More marginalized farmers, particularly women, had low participation. CFPs also face challenges to their sustainability, including inconsistent feed and water supplies, poor infrastructure and high staff turnover. Key to enhancing participation in CFPs, will be improving the way they are supported and embedded within communities.

### KEYWORDS

Smallholder livestock marketing; sustainability; livelihoods; custom feeding programme; South Africa

## 1. Introduction

With an asset value of more than US\$1.4 trillion and employing more than 1.3 billion people globally, livestock market chains play a significant role in agriculture-based livelihoods (Thornton, 2010). In addition to supporting over 600 million smallholder farmers, livestock form part of an important risk management strategy for poor households in developing countries (Thornton, 2010). With increasing climate variability predicted to impact negatively on agricultural productivity (Godfray & Garnett, 2014), the role of livestock in buffering smallholder systems against climate change is set to become more important (Rust & Rust, 2013).

Livestock farming remains a vital activity for smallholder farmers in sub-Saharan Africa (Dovie, Shackleton, & Witkowski, 2006), and a key component of the

livelihoods of more than 52.5 million poor livestock keepers in Southern Africa (McDermott, Staal, Freeman, Herrero, & Van de Steeg, 2010). Over 90% of livestock keepers in Southern Africa are classified as smallholder farmers and they own about 75% of the livestock in the region (Nyamushamba, Mapiye, Tada, Halimani, & Muchenje, 2017). In South Africa, 82% of land is suitable for agriculture, 13% being estimated to be arable, and 69% suitable for livestock and wildlife production (DAFF, 2017). The communal farming sector (wherein livestock production is undertaken on land that is collectively accessed and managed) occupies an estimated 17% of this land area and accounts for 40% of the estimated 13.4 million cattle currently held in South Africa (DAFF, 2017). The largest financial investment in agricultural assets in these communal areas can be attributed to

livestock. There is considerable untapped potential for livestock to further contribute to the livelihoods of the rural poor, as the importance of livestock to smallholder households is likely to increase in the face of rising population growth and unemployment (Vetter, 2013). However, the contribution of the 3.3 million smallholder livestock farmers in communal areas to the formal beef sector remains low, with offtake estimated at between just 5 and 10% (Museumwa, Mushunje, Chimonyo, & Mapiye, 2010; Ndoro, Hitayezu, Mudhara, & Chimonyo, 2013).

Livestock-based livelihoods have the potential to drive inclusive, climate-resilient economic development in the communal areas of Eastern Cape Province, South Africa. Eastern Cape Province accounts for the highest proportion (24%) of the cattle population in South Africa, estimated at over 3.1 million cattle (DRDAR, 2014). With over 60% of the cattle in the province being in communal areas (Mkabela, 2013), the contribution of communal cattle to smallholder livelihoods through alternative marketing strategies could be significant. Smallholder farmers, however, face a host of challenges in accessing formal market systems, particularly since the deregulation of the South African meat industry through the Marketing and Agriculture Act number 47 of 1996 (Soji et al., 2015). Meissner, Scholtz, and Palmer (2013a) argue that smallholder farmers struggle with deregulation due to competition from established commercial farmers in an uncontrolled formal market system. High transaction costs mainly due to distance to markets and fees to acquire statutory documents such as transport permits (Sotsha et al., 2017), limit smallholder farmers' participation in formal market systems. Authors also attribute low formal market offtake in communal areas to poor marketing infrastructure (Sikwela & Mushunje, 2013), poor access to formal markets, lack of information and the pricing structure (Meissner, Scholtz, & Engelbrecht, 2013b). Smallholder farmers often lack adequate information on formal markets, including the carcass classification system and pricing structure, which usually pays lower prices for the older, indigenous and crossbred cattle, smallholder farmers possess.

Smallholder livestock production systems are characterized by poor production efficiency (Meissner et al., 2013b) and poor condition of animals (Mapiye, Chimonyo, Dzama, Raats, & Mapekula, 2009), mostly resulting from seasonally overgrazed and overstocked rangelands that are poorly managed (Bennett, Ainslie, & Davis, 2013). Furthermore, according to Nyamushamba et al. (2017), 66.4% of cattle herds in the

smallholder sector of South Africa consist of crossbred cattle, further limiting productivity. However, these limitations on productivity must be viewed in the context of the multiple roles cattle play in communal areas (Twine, 2013). Both Vetter (2013) and Meissner et al. (2013b) make a compelling argument that significant cattle trade occurs through informal markets within the communal sector, which is not captured in official statistics, hence the off-take for communal areas might well be higher than is currently recognized. Overall, considerable livestock trade in Africa occurs through informal trade (de Haan, Quarles van Ufford, & Zaal, 1999; Eid, 2014; Mpairwe, Zziwa, Mugasi, & Laswai, 2015). Informal marketing of cattle plays a significant role in communal livelihoods in South Africa, hence alternative marketing strategies that harness the benefits of informal marketing will be important for smallholder systems.

Alternative strategies do already exist in other parts of the world to increase the competitiveness of smallholder farmers in both formal and informal cattle markets. In Vietnam, for example, smallholder farmers intensified livestock production by adopting a stall-fed system as an alternative to the traditional grazing system, enabling them to be more competitive in formal livestock markets (Stür, Khanh, & Duncan, 2013). Likewise, 'retained-ownership' in custom feedlots has been applied in the United States as a marketing alternative to the conventional auction and feedlot method (Gillespie, Basarir, & Schupp, 2004). Retained-ownership is a marketing agreement where ownership of cattle is usually maintained by the seller throughout the feedlot phase, and the seller is then paid when the cattle are sold (Gillespie et al., 2004). A retained-ownership market alternative has been initiated in the Eastern Cape Province of South Africa, in the form of Custom Feeding Programmes (CFPs). Smallholder cattle are brought to a CFP but remain owned by the producers (NAMC, 2013).

The Eastern Cape Red Meat Project was introduced in 2005, under ConMark Trust, with the objective of increasing formal market participation of communal and emerging livestock farmers (Sotsha et al., 2017). To a lesser extent, the programme also aimed to 'systematise' the informal marketing of cattle, which entails collective and organized informal marketing of cattle to achieve consistently higher informal market prices. The programme was subsequently handed over to the National Agricultural Marketing Council (NAMC) in 2009, which organized it into CFPs and expanded it to other provinces as part of a national

initiative called the National Red Meat Development Programme (NRMDP). NAMC has now established 11 CFPs within Eastern Cape Province, aimed at finishing communal cattle using grain-based commercial feed for a period of 120 days for a subsidized, fixed fee (Ntombela, Lindikaya, & Nyhodo, 2013; Nyhodo, Mmbengwa, Balarane, & Ngetu, 2014). There have been few studies on the performance and impact of these CFPs, and those that have been undertaken have focused mainly on livestock off-take (Marandure et al., 2016b) and feed dynamics (Nyhodo et al., 2014). Moreover, in light of the widely recognized constraints to increased market participation by smallholder farmers in South Africa and poor record of state-supported service delivery to farmers (e.g. DAFF, 2018; Musemwa et al., 2010) serious questions remain about how sustainable CFPs are from a social (equity and participation) and operational perspective. This paper seeks to address this by: (a) evaluating in greater depth the contribution of CFPs to communal livestock marketing and associated income and for whom; (b) exploring the challenges to wider participation in the CFPs by the communities in which the CFPs are located; and (c) analyzing the operational constraints to continued functioning of CFPs.

## 2. Methodology

### 2.1. Study sites

The study was conducted using eight of the eleven CFP sites in Eastern Cape Province (Table 1 and Figure 1). The three remaining CFPs were found not suitable for inclusion. Nyandeni CFP was excluded because it had only been recently established and thus did not have sufficiently comprehensive data on cattle marketing. Fort Cox CFP was excluded because it was located at a considerable distance from the other CFPs and was difficult to access. Ikhephu CFP was excluded because it was designed to support emergent commercial farmers on freehold or leasehold land and hence was not comparable with the other CFPs, which were all supporting livestock farmers in communal areas.

The Province has an arid to semi-arid climate with a mean annual rainfall range of 400–600mm, being lowest towards the western interior and highest towards the coast. Most vegetation in the province is classified locally as sourveld, meaning that it becomes unpalatable to livestock during the dry season. The region is characterized by generally

shallow sandy soils unsuitable for crop production (Nqeno, Chimonyo, & Mapiye, 2011). Eastern Cape Province has the second highest poverty incidence in South Africa (ECPC, 2014) and subsistence-based agriculture remains the dominant production system in communal areas, centred on the former homelands of Ciskei and Transkei.

### 2.2. Data collection

A mixed methods approach was employed, with qualitative and quantitative data being collected. Key informant interviews were held with CFP supervisors, extension officers, veterinary practitioners, committee members, Department of Rural Development and Agrarian Reform (DRDAR) and Department of Rural Development and Land Reform (DRDLR) staff and local authority staff. Secondary data on cattle sales was collected from records kept at the eight CFPs every three months from January to December 2017. Data was also collected through a survey questionnaire. The survey questionnaire was administered to 177 farmers who were purposefully sampled from records of the eight CFPs based on ownership of livestock and within this a mix of male and female headed households (Gxwalibomvu = 22, Ngangeqjili = 22, Kamastone = 23, Komani = 22, Lahlangubo = 22, Lower Hukuwa = 23, Umzimvubu = 22, Ncorha = 21). The questionnaire captured data on household demographics; socio-economic status; cattle herd dynamics and marketing; and reasons for participation or non-participation in the CFP.

### 2.3. Data analysis

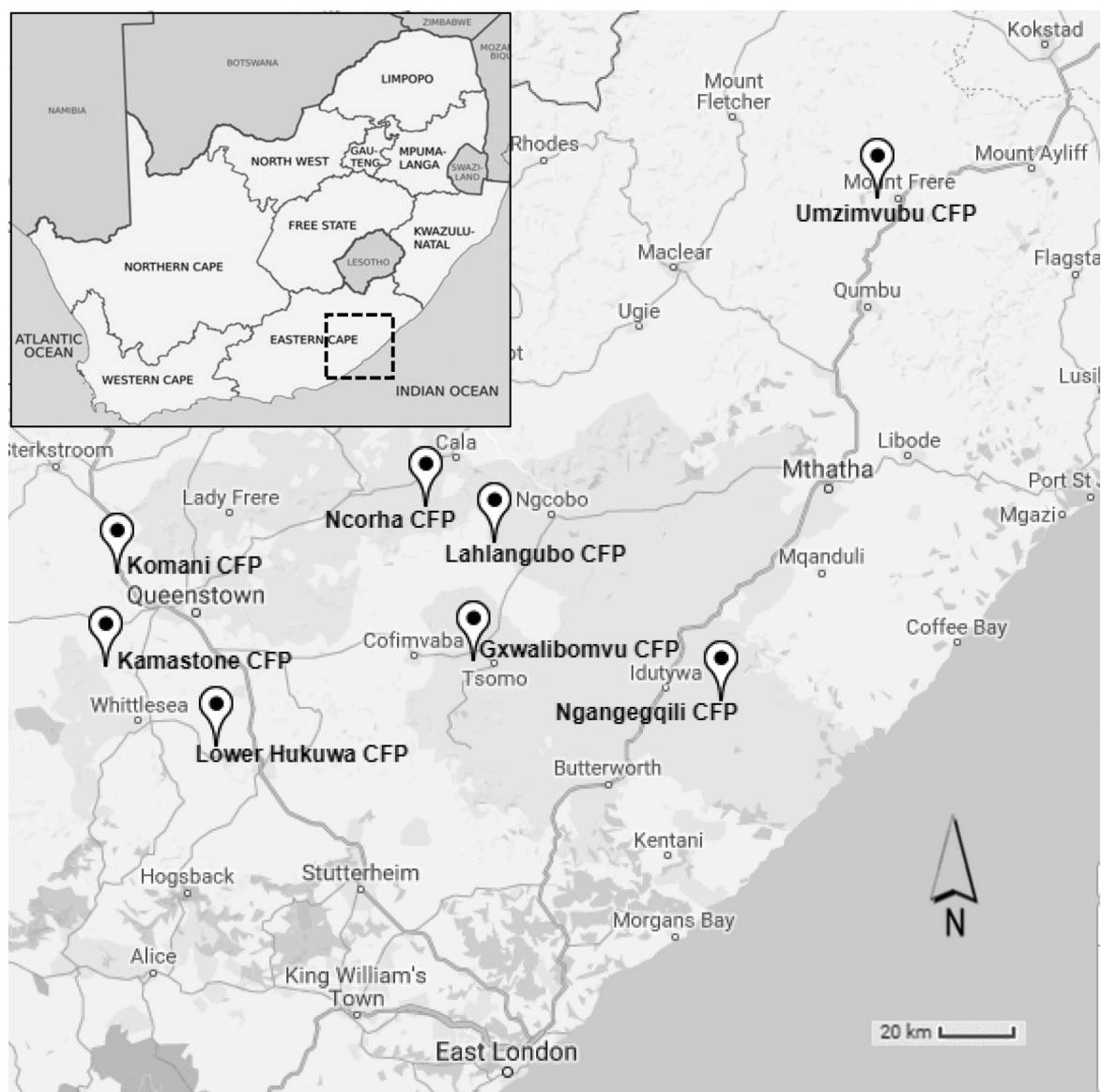
Quantitative household socio-economic, demographic and livestock marketing data was analyzed using descriptive statistics in SAS (SAS, 2012). Cattle herd composition and marketing data were analyzed by one-way ANOVA using the PROC GLM Procedure in SAS (2012). Representative excerpts from the qualitative information contained in key stakeholder interviews and survey questionnaires were used to contextualize and support relationships identified in the quantitative data (Shackleton & Luckert, 2015).

## 3. Results

Several key factors constraining the sustainability of the CFP approach to livestock marketing were reported by farmers.

**Table 1.** The studied Custom Feeding Programmes in Eastern Cape Province, South Africa.

CFP	Carrying Capacity	Location	Local Municipality	District Municipality
Gxwalibomvu	540 cattle	Tsomo	Intsika Yethu	Chris Hani
Ncorha	540 cattle	Ncorha	Intsika Yethu	Chris Hani
Komani	250 cattle	Queenstown	Lukhanji	Chris Hani
Lahlangubo	350 cattle	Engcobo	Engcobo	Chris Hani
Kamastone	540 cattle	Whittlesea	Lukhanji	Chris Hani
Lower Hukuwa	540 cattle	Whittlesea	Lukhanji	Chris Hani
Umzimvubu	80 cattle	Lugangeni	Umzimvubu	Alfred Nzo
Ngangegqili	200 cattle	Idutywa	Mbhashe	Amathole



**Figure 1.** Map indicating location of CFPs in the Eastern Cape Province, South Africa  
 [Source: maps adapted by author using scribble maps (<https://www.scribblemaps.com/>)].

### 3.1. Socio-cultural constraints to cattle marketing

Although the communal CFPs have regulatory requirements such as age, sex, branding and dehorning for cattle that are allowed entry into CFPs, none of them enforce any of the restrictions, resulting in farmers bringing old animals of any breed (Table 2).

This is understandable within the socio-cultural context of cattle ownership in communal areas, where farmers do not generally sell young animals (Mapiye, Chimonyo, & Dzama, 2009; Ashley et al., 2018). Rather, cattle, particularly indigenous breeds, are socio-cultural assets which contribute to the 'agrarian culture and heritage' of communal farmers through important rituals and ceremonies (Nyamushamba et al., 2017, p. 604). For this reason, most communal farmers are likely to market only older, spent animals (Chingala, Raffrenato, Dzama, Hoffman, & Mapiye, 2017; Strydom et al., 2015). This presented a challenge for communal CFPs to meet their objective of marketing communal cattle into formal markets, by attempting to control the type of animals they processed.

Furthermore, nearly 90% of respondents possessed 'non-descript', crossbred cattle, which are a result of uncontrolled crossbreeding of indigenous (*Bos indicus* and *Bos taurus africanus*) with imported (*Bos taurus*) breeds. The remaining 10% owned indigenous breeds. Non-descript crossbreds first appeared in low-

input communal rangeland production systems in South Africa during the colonial and apartheid eras. Imported breeds were introduced to improve live-stock performance in communal areas, but were unsuccessful due to high maintenance requirements and susceptibility to diseases and droughts (Mapiye et al., 2007).

Recent research shows that non-descript crossbred and indigenous cattle are primarily kept by small-holder farmers for their hardiness and disease resistance, which enables their survival in rural smallholder ecosystems that are characterized by high temperatures, high disease and parasite incidence, low nutrition and recurrent droughts (Mwai, Hanotte, Kwon, & Cho, 2015). However, from a production perspective, these non-descript crossbred and indigenous cattle are characterized by low feed utilization efficiency, small to medium frames and lower mature weight averaging 225–450kgs (Nyamushamba et al., 2017), and hence do not gain much weight when channelled through CFPs. The net result is that these animals fetch lower average prices when sold through formal markets, based on the current beef carcass classification system (Chingala et al., 2017). Most of the CFPs initially tried to market the non-descript crossbred and indigenous cattle they received to abattoirs but were discouraged by the prices attained. For instance, producers from Ncorha and Gxwalibomvu CFPs initially sold their cattle to abattoirs but only realized an average price of <sup>1</sup>ZAR6 000 (US\$462.00) per animal. The low-weight, old age and flat body conformation of communal cattle means their carcasses are normally classified as C4–5 grade, which has a lower price per kg of meat (Soji et al., 2015). This was illustrated by a cattle owner from one of the CFPs, who suggested that:

'The CFP sold my big cow to a local abattoir, and I got very little money for it, just ZAR5000 (US\$385). It was bigger than the cow that my neighbour sold to another farmer, but my neighbour got ZAR8500 (US\$655). I will not sell to the abattoir again'

Marketing efficiency in formal markets such as abattoirs requires a consistent supply of large volumes of good quality animals, pre-requisites that the communal CFPs generally fail to meet due to inconsistent cattle sales patterns and inappropriate herd structure (too many older animals and bulls) in the communal areas where animals are drawn from (Marandure et al., 2016b). However, there was variation between the CFPs in their capacity to achieve this.

**Table 2.** 2017 cattle marketing dynamics for eight studied CFPs in the Eastern Cape Province, South Africa.

CFP	Cattle intake	Cattle sold	Class of most animals brought	Markets sold to
Gxwalibomvu	136	95	Old mixed breeds	Informal market
Ngangegqili	104	78	Old mixed breeds	Informal market
Kamastone	27	4	Old/young mixed breeds	Informal market
Komani	135	125	Old/young mixed breeds	Informal/auction/abattoir
Lahlangubo	151	133	Old/young mixed breeds	Informal market/abattoir
Lower Hukuwa	68	18	Old/young mixed breeds	Informal market
Umzimvubu	250	198	Old mixed breeds	Informal market
Ncorha	74	31	Old mixed breeds	Informal market

Kamastone and Lower Hukuwa CFPs processed significantly higher weaner, cow and steer numbers than the other CFPs except Ncorha CFP ( $p < 0.05$ ). The trend is reflected in the significantly larger ( $p < 0.05$ ) mean herd sizes of 21 and 23 cattle in Kamastone and Lower Hukuwa CFP communities respectively (Figure 2), compared to a mean herd size across all the communal CFP communities of 12 cattle in 2016.

In rural communities, an increase in herd size increases propensity to participate in markets and consistency of market participation (Enkono, Kalundu, & Thomas, 2013), with those who have small herd sizes unlikely to sell. The significantly higher ( $p < 0.05$ ) herd sizes (Figure 2) and mean annual cattle sales (Table 3) in Kamastone and Lower Hukuwa CFP support this relationship. In the U.S. stocker cattle market, herd size had a positive correlation with probability of selling and the marketing channels accessed (Schmitz, Moss, & Schmitz, 2003).

The unwillingness of cattle owners to sell young animals is further underlined by the fact that participants marketed an overall average of just 0.3 weaners per household in 2016 compared to 2 steers and 1 cow. Randela (2003) reported that young animals such as heifers are rarely sold by communal farmers as they are considered important for future herd building. This is problematic for CFPs because officially, their focus should be on marketing young animals which optimize value addition of CFPs to cattle production.

Amongst the farmers surveyed, there was a diversity of income sources, with only a relatively small proportion (9–24%) of respondents depending entirely on livestock for their income (Table 4). This underlines how smallholders in communal areas spread risk

within households and are generally unwilling to focus on a single source of livelihood. Indeed, 41–64% of respondents derived no cash income at all from livestock in 2016, and at least 30% of all households depended for their income on social grants and pensions. Marandure et al. (2016a) reported similar findings.

Nonetheless, it is clear that periodic livestock sales remain an important part of the livelihood strategies of many households. Amongst those households that sold cattle, overall mean income from cattle sales was estimated at ZAR11 609 (US\$894) in 2016, which accounted for 32% of mean annual household income. This is similar to 22% and 31% reported by Ashley et al. (2018) and Bishu, Lahiff, O'Reilly, and Gebregziabher (2018) respectively.

### 3.2. Marketing channels and value addition

In 2016, the communal CFPs had an average cattle offtake rate of 16.6%, similar to the 15.8% reported by Sotsha et al. (2017) in their study of CFPs in five district municipalities. This is considerably higher than the 5% offtake rate reported for most communal systems in South Africa (e.g. see Mapiye et al., 2007; Musemwa et al., 2010; Sotsha et al., 2017). In this respect, it can be concluded that CFPs have been effective in enhancing communal cattle offtake for those engaging with the CFPs. However, off-take figures in the current study remain well below the 25–30% reported for commercial cattle production systems in South Africa (Scholtz & Bester, 2010; Sotsha et al., 2017). This most probably reflects the fact that most communal farmers have still not fully committed themselves to commercial livestock production due to the risks involved and small herd sizes (Lubungu, Sitko, & Hichaambwa, 2015; Marandure et al., 2016b); and that CFPs cannot fully support communal farmers to engage with formal markets.

Given the context outlined in the previous sections, the study also attempted to understand the marketing channels that the smallholder farmers engaged with, and the reasons for engaging with those channels. The results indicate that at-least 77% of communal farmers channelled most of their cattle to informal markets either directly by selling to other farmers or through CFPs that in turn sold to the informal market (Table 5). The communal farmers occasionally sold through 'middlemen',<sup>2</sup> who either supplied to the formal or informal market. The formal market

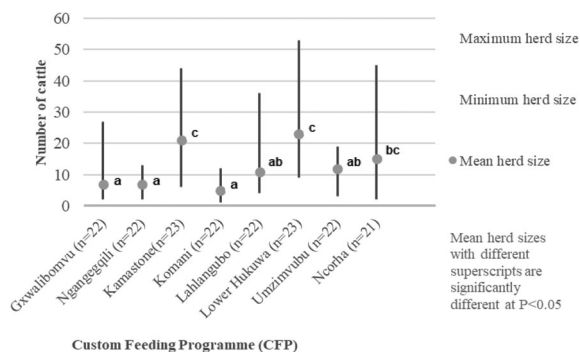


Figure 2. Minimum, maximum and mean herd size for eight CFP communities studied in the Eastern Cape Province, South Africa.

**Table 3.** 2016 mean annual cattle sales data for eight communal CFP communities studied in the Eastern Cape Province, South Africa ( $n = 177$ ).

CFP	Gxwalibomvu	Ngangegqili	Kamastone	Komani	Lahlangubo	Lower Hukuwa	Umzimvubu	Ncorha	Overall mean
Mean cattle sold	0.7 <sup>ab</sup>	0.4 <sup>a</sup>	3 <sup>d</sup>	0.2 <sup>a</sup>	1 <sup>bc</sup>	3 <sup>d</sup>	2 <sup>cd</sup>	2 <sup>cd</sup>	2
Standard deviation	1	0.6	2	0.9	2	2	4	2	2

Values within a row followed by different superscripts (a,b,c,d) are significantly different at  $P < 0.05$ .

consists mainly of abattoirs and is currently accessed only by smallholder farmers from Lahlangubo and Komani CFPs. Therefore, six out of the eight communal CFPs did not engage with the formal market directly in the communities studied (see also Table 2).

Overall, a larger number (78%) of cattle were sold informally owing to the 17% higher average price realized of ZAR8 614 (US\$663) compared to other marketing channels in 2016 (Table 5). Abattoirs and middlemen, who constitute or contribute to the formal sector, provided lower (although not significantly so) average prices of ZAR7 267 (US\$559) and ZAR7 015 (US\$540) respectively than cattle sold through CFPs and to 'other farmers'. Producers at Gxwalibomvu, Ngangegqili and Kamastone sold fewer cattle through CFPs than in other communities. Respondents from Kamastone CFP preferred to sell cattle through middlemen and 'other farmers' than through the CFP.

Importantly, the CFPs provided an opportunity for communal farmers to attain higher prices for older animals and reduce transaction costs. In this regard, CFPs centralized or 'systematised' the marketing of communal cattle, which might help to explain the higher mean offtake of 16.6% in the communities that have access to these CFPs. Thus, CFPs appear to function as communal cattle hubs, providing buyers with an opportunity to access communal cattle in bulk from a 'central' point and thereby improve efficiency in smallholder cattle marketing, with buyers spending less time locating and purchasing animals. Livestock marketing in formal markets accrues high transaction costs mainly due to long distances, slaughter fees, taxes and statutory document fees such as transport permits (Mapiye, Makombe, Mapiye, & Dzama, 2018; Sotsha et al., 2017). CFPs enabled communities within the locality of the CFPs to reduce these transaction costs when buying cattle, as they could access cattle from long distances without incurring the associated transport costs. Most CFPs drew cattle mostly from villages located 21–50 km away, but in some cases as far as 100 km or more from the CFPs (Table 6).

Interestingly, communal farmers who were located further from CFPs seemed to engage more with CFPs than those situated in villages immediately adjacent to the CFPs, particularly at Gxwalibomvu, Kamastone, Lahlangubo, Lower Hukuwa and Ncorha CFPs. It was related by key informants that when CFPs opened, the farmers nearest to the CFPs brought animals to them. However, due to feed supply shortages some animals died in CFPs and farmers were not compensated, resulting in these local farmers disengaging from the CFPs. About 67% of the respondents who brought cattle from 20kms or further from the CFPs also responded that there are limited market opportunities in their areas, and they were able to get consistently higher prices at CFPs.

More importantly, communal farmers who were bringing cattle from long distances brought larger numbers of animals and had cost-reduction arrangements. One communal farmer bringing animals from 72 km away explained that:

'I combine my animals with my neighbour, and we hire one truck. When we share transport costs, we still make a better profit than selling in the villages around here'.

Some 63% of the farmers bringing cattle from over 50 kms sold larger cattle numbers and also had their own transport to bring cattle to CFPs. These farmers, who effectively represent 'petty commodity producers', brought large numbers of weaners that enabled Lahlangubo and Komani CFPs to access the formal market. For example, in November 2017, Lahlangubo CFP had 38 weaner steers brought in by three farmers, which were sold to a local abattoir for an average price of ZAR8 500 (US\$655) each. For this relatively well-off minority, CFPs add value to their animals by opportunistic marketing and the utilization of the subsidized feed and labour the CFPs provide.

### 3.3. Understanding farmer engagement with CFPs

The study also characterized reasons for participation and non-participation in CFPs (Table 7). Of the 96 (54.2%) respondents who utilized CFPs, 77 (80%)



**Table 4.** Income sources for the eight CFP communities studied in the Eastern Cape Province, South Africa in 2016 ( $n = 177$ ).

CFP	Income sources (% of respondents)							
	Livestock only	Livestock + Social grant	Livestock + Pension	Livestock + Salary	Social grant only	Pension only	Salary only	Mean cattle income (ZAR)
Gxwalibomvu	9	11	14	18	30	15	3	9,626 <sup>a</sup>
Ngangegqili	10	13	9	13	13	18	20	10,232 <sup>a</sup>
Kamastone	21	12	4	5	32	19	7	11,728 <sup>b</sup>
Komani	10	18	8	13	34	4	13	10,482 <sup>a</sup>
Lahlangubo	16	10	9	8	16	18	23	12,105 <sup>b</sup>
L. Hukuwa	24	4	5	3	30	17	17	12,948 <sup>bc</sup>
Umzimvubu	18	11	12	14	33	8	4	13,492 <sup>c</sup>
Ncorha	10	13	8	9	31	15	14	12,261 <sup>b</sup>

Values within a column followed by different superscripts (a,b,c) are significantly different at  $P < 0.05$ .

utilized CFPs for marketing-related reasons. Of these, 52 (54.2%) utilized CFPs to attain relatively higher selling prices than through conventional marketing channels. Secondary data indicated that some animals were sold for as much as ZAR13 000 (US \$1,001) through Umzimvubu CFP and ZAR15 000 (US \$1,155) through Gxwalibomvu CFP, although data on age, weight, breed and conformation of these animals was not recorded. In this instance, CFPs seem to have managed to achieve the objective of attaining consistently higher prices for those communal farmers who engaged with them. Ouma, Obare, and Staal (2003) reported that communal cattle which receive supplementary feed are likely to be priced higher than those relying solely on communal grazing.

The ability to negotiate was also a key factor in encouraging utilization of CFPs. When a buyer in the informal market identified an animal to buy from the

CFP, the owner of the animal was called, and they negotiated with the buyer on the animal price. In contrast to the rigid carcass classification system in the formal system, visual appraisal and negotiation determines cattle prices in informal systems (Soji et al., 2015). CFPs mediated, and then deducted their fixed fee (which ranged from ZAR800 (US\$62) to ZAR1 000 (US\$77) for the 120-day feeding period) from the agreed buying price and paid the owner the difference. One communal farmer indicated that:

'We prefer to market to other farmers directly or through CFPs, because we are familiar with them and we can negotiate the price. Negotiating is easy to do because these buyers know our cattle already, therefore they are confident that we are not selling them poor animals'.

On this basis we suggest that one of the key values of the CFP approach lies in its compatibility with the ethos of communal cattle production systems. Cattle have multiple non-market livelihood benefits in rural communities including provision of milk, manure and draught power (Mwai et al., 2015), and hence households will usually only sell animals when they are older and less useful to them (Soji et al., 2015). This helps to explain why 14 (14.6%) of communal

**Table 5.** Cattle marketing channels and average prices obtained in eight Communal CFPs studied in Eastern Cape Province, South Africa in 2016.

CFP	Average number of animals marketed through channel			
	Abattoir	CFP	Middle-men	Other Farmers
<i>Gxwalibomvu</i>	.	1	1	2
<i>Ngangegqili</i>	.	1	.	2
<i>Kamastone</i>	.	1	2	3
<i>Komani</i>	3	2	.	1
<i>Lahlangubo</i>	1	2	1	2
<i>Lower Hukuwa</i>	.	3	2	2
<i>Umzimvubu</i>	.	2	1	1
<i>Ncora</i>	.	2	1	2
<i>Mean cattle sold</i>	2	3	2	2
<i>Total cattle sold</i>	8	96	34	52
<i>Average price (ZAR)</i>	7267 <sup>a</sup>	8614 <sup>a</sup>	7015 <sup>a</sup>	8612 <sup>a</sup>

Values within a row followed by different superscripts (a,b,c) are significantly different at  $P < 0.05$ .

**Table 6.** Catchment area for the eight communal CFP communities studied in the Eastern Cape Province, South Africa in 2016.

CFP	Number of villages in relation to distance (kms) from CFP						Mean distance
	<5	5–10	11–20	21–50	51–100	>100	
<i>Gxwalibomvu</i>	2	1	.	4	1	1	41
<i>Ngangegqili</i>	2	3	.	4	2	.	37
<i>Kamastone</i>	2	1	1	3	.	.	18
<i>Komani</i>	1	2	1	2	1	.	29
<i>Lahlangubo</i>	1	1	2	3	1	1	49
<i>Lower Hukuwa</i>	2	1	2	6	.	.	23
<i>Umzimvubu</i>	2	2	1	1	.	.	15
<i>Ncora</i>	1	1	1	2	2	1	46

**Table 7.** Reasons for (non-)participation in CFPs in communities studied in the Eastern Cape Province, South Africa in 2016 ( $n = 177$ ).

Reason for CFP participation	Number of respondents								
	Gw	Ng	Ka	Ko	La	L.H	Um	Nc	Tot.
Attaining higher price	6	5	7	7	6	7	9	5	52
Marketing old animals	2	2	1	1	2	1	3	2	14
Ease of marketing/negotiation	1	1	2	1	2	1	2	1	11
Access to cheap feed/drugs	1	1	2	1	.	2	1	1	9
Fattening for rituals	1	2	.	1	1	.	.	1	6
Drought mitigation	.	1	.	1	2	.	.	.	4
Subtotal	11	12	12	12	13	11	15	10	<b>96</b>
<b>Reason for CFP non-participation</b>									
Lack of feed/drugs poses risk	2	2	4	3	2	4	3	3	23
Small herd size/no reason to sell	2	3	1	2	3	2	2	1	16
Lack of compensation for deaths/theft	3	2	2	1	1	2	1	2	14
Lack of adequate information	1	1	2	1	2	2	1	1	11
CFPs not well managed	1	1	1	2	.	2	.	.	7
Do not have old or sick animals	1	1	.	1	1	.	.	2	6
CFPs take too long to sell animals	1	.	1	.	.	.	1	1	4
Subtotal	11	10	11	10	9	12	8	10	<b>81</b>

Key: Gwxalibomvu (Gw); Ngangegqili (Ng); Kamastone (Ka); Komani (Ko); Lahlangubo (La); Lower Hukuwa (L.H); Umzimvubu (Um) and Ncora (Nc). Total respondents (Tot.)

farmers who made use of CFPs indicated that they found them useful in disposing of old animals, which would be difficult to sell into the formal market. Importantly, in doing so, CFPs (at least in the way they are currently being utilized) enable communal farmers to also benefit from the non-market outputs accrued during the period in which cattle are retained at households before being sold. One communal farmer explained it thus:

'I do not have money to hire a tractor, so I use my animals for draught power. It used to be hard for me to sell them when they are old, and it was difficult for me to replace them. Now I get meaningful income and I now frequently replace the animals I use for draught power'.

These non-market outputs were estimated by Dovie et al. (2006) to be worth US\$656 per household per annum. The combined value of non-market outputs and the sales value of 'spent' cattle sold through CFPs, if properly supported and harnessed, might be

where CFPs add the greatest value to communal livelihoods and livestock production systems.

Eighty-one (45.8%) respondents indicated that they did not utilize CFPs at all, and most of the reasons provided were risk-linked. Of the non-participants, 37 (45.7%) farmers cited the periodic lack of feed/drugs and lack of compensation in the event of animal death/theft in CFPs as risks they were not willing to take. The standard policy of communal CFPs is that animals are brought to CFPs at the 'owner's risk', hence farmers were not compensated in the event of animal deaths/theft whilst in CFPs.

Eleven (13.6%) non-participants cited lack of adequate information as a reason for not engaging with CFPs (Table 7). Indeed, overall, the respondents indicated a general lack of understanding of the purpose or function of CFPs and risks associated with utilizing CFPs but were more confident in their knowledge of prices attained at CFPs. This apparent

**Table 8.** Key metrics and gender dynamics of CFP (non-)participants studied in the Eastern Cape Province, South Africa in 2016 ( $n = 177$ ).

Component	Participants		Non-participants	
N value	96 households		81 households	
Gender	85% male: 15% female		61% male: 39% female	
Mean herd size	15.4 cattle		10.6 cattle	
Mean cattle sales	2.7 cattle		1.4 cattle	
Mean annual livestock income per household	ZAR12743 (US\$924)		ZAR 9,765 (US\$752)	
Income sources: (%)	Livestock only	18.3	Livestock only	11.4
	Livestock + Social grant	12.3	Livestock + Social grant	10.6
	Livestock + Pension	7.4	Livestock + Pension	6.9
	Livestock + Salary	12.9	Livestock + Salary	8.9
	Social grant only	23.4	Social grant only	35.5
	Pension only	15.6	Pension only	14.3
	Salary only	10.1	Salary only	12.4

lack of information might point to inadequate consultation with the communities in the setting up of CFPs. Coetzee, Montshwe, and Jooste (2005) reported that lack of adequate information negatively affected participation of communal farmers in markets.

The confusion farmers had in understanding the purpose of CFPs is evidenced by the fact that 6 (7.4%) of them perceived CFPs as being designed to support old or sick animals. For instance, one respondent suggested that:

'I do not have old cattle that need to be sent to the CFP. As far as I know it is only the old cattle in poor condition that should be sent to the CFP'.

Participation was also skewed by gender and power relations. Women in particular, had low participation in CFPs (Table 8). In the current study, women constituted 25.9% of the respondents, but accounted for only 14.6% of CFP participants (Table 7). Women owned 13.8% of the total cattle with an average herd size of 7.1 cattle compared to men who owned 86.2% of cattle with an average herd size of 12.6 cattle. Similarly, Mapiye et al. (2018) found that 87% of cattle owners were male. Women sold an average of just 1.2 cattle per annum against an average of 2 cattle per annum for men and contributed only about 6% of the cattle channelled through CFPs. Moreover, in surveyed households, men were confirmed as having decision-making authority over cattle, and needed to be consulted when decisions to sell cattle and participate in CFPs were made. Even in female-headed households, men in the extended family generally needed to be consulted over decisions to market cattle. One female respondent indicated that:

'My late husband left me cattle, but they still remain the property of his family. When I want to sell cattle, I must inform my late husbands' brothers, who then give the go ahead to sell. They do not stay in this village, so it takes time to get a response from them sometimes'.

Gender disparity in cattle ownership and marketing decisions is a well-documented phenomenon (e.g. IFAD, 2010; Njuki & Sanginga, 2013; World Bank, 2009).

Overall, however, CFP participants had larger mean herd sizes, sold more cattle and derived a higher percentage of their income from cattle compared to non-participants (Table 8). The table also indicates that poorer households (at-least based on herd size) tended not to participate in markets and relied more on social grants. This underlines the need for additional strategies to support poorer farmers to participate in marketing initiatives.

CFPs were run by committees, and the selection of committee members was frequently politically driven, with several holding influential positions such as through chieftaincy or a local government position. While these influential members were often viewed by participants as beneficial in representing the needs of CFPs to local government, the committee members were often part of a wealthy elite and were well-positioned to benefit personally from the utilization of CFPs. For example, at one CFP, the chief was selected to be the CFP chairperson due to being 'connected' to the DRDAR, and hence in a position to influence provision of resources from the DRDAR. In this sense, such strategic decisions might be considered more as a form of 'benevolent capture' as opposed to 'malevolent elite capture' (Arnall, Thomas, Twyman, & Liverman, 2013; Mansuri & Rao, 2004). According to Wong (2010, p. 2), '... a pragmatic use of elites' networks and resources channels benefits to poor communities'. However, these elites often channelled large numbers of their own cattle through CFPs, raising questions about how 'benevolent' their intentions were. Research indicates that the poor are least targeted and often do not benefit when power and authority is vested within an elite group (Mansuri & Rao, 2004).

### 3.7. Structural and functional constraints to the sustainability of CFPs

The ability of CFPs to contribute to 'systematising' informal markets, and to facilitate engagement with formal markets is also constrained by various structural and functional challenges. First, and most importantly, CFPs have experienced a serious challenge with inconsistent feed supplies received from government. This contributed significantly to the general lack of confidence of smallholders in CFPs, as well as operational challenges in CFPs meeting their 120-day fattening objective. For instance, seven out of eight CFPs had severe feed challenges between September and December 2016. Lack of feed affected planned livestock sales in CFPs, as the animals were in a poor condition and not suitable for sale after the 120-day period they are expected to stay in the CFP. More importantly, prolonged lack of feed resulted in animal deaths in CFPs. Feed-related animal deaths occurred in all the CFPs in 2016. For example, Lower Hukuwa and Kamastone CFPs had a total of 18 cattle deaths due to starvation, resulting in these two CFPs temporarily closing from October 2016 to August

2017. The scepticism this issue engendered amongst respondents at Ncorha and Gxwalibomvu CFPs was illustrated by one local farmer who indicated that:

'When the CFP opened, a lot of us in the community put our animals there. But there was no feed for some time, and our animals died. From that time, most of us are afraid to utilise the CFP. They are risky'.

This feed challenge was compounded by the difficulties communal cattle, raised on relatively poor rangeland, had in adapting to commercial feed. Cattle brought to CFPs were mostly older animals accustomed to communal grazing, and hence took longer to adapt to grain-based commercial diets than commercial breeds would. A sufficient period of adaptation is essential for ruminal microflora to adjust to the new high grain diets. High grain diets require appropriate management and gradual adaptation to feed, as cattle may develop ruminal acidosis among other disorders (da Silva et al., 2018). The situation was exacerbated by veterinary drug and dipping chemical shortages at the CFPs. For instance, Lower Hukuwa, Kamastone and Lahlangubo CFPs experienced lack of veterinary drugs and dipping chemicals for long periods, and often resorted to asking owners of the animals themselves to supply these when animals were sick. CFPs also reported that they did not have adequate access to extension and veterinary services, relying on the knowledge of CFP supervisors for animal health-related challenges.

Ncorha, Gxwalibomvu, Lugangeni, Kamastone and Lower Hukuwa CFPs also reported problems with their water supply. At Gxwalibomvu CFP, water used for animals was connected to the local water supply, hence the CFP experienced water supply problems when there were pipe bursts in the local community, which sometimes took a long time to be fixed. Ncorha CFP, which was supplied by a windmill, experienced water supply problems due to continuous windmill breakdowns. Ngangegqili CFP did not have an on-site water supply and instead relied on water being brought to the CFP by a water truck at considerable cost. More recently, animals at Ngangegqili CFP were utilizing a nearby river for water.

The infrastructure at some of the CFPs has also become dilapidated. For instance, the roof leaked at Ncorha, Gxwalibomvu and Ngangegqili CFPs, allowing water into feed troughs during the rainy period, resulting in feed spoilages and risk of aflatoxin poisoning. Ngangegqili CFP had spaced strands of barbed wire as boundary fencing, which allowed chickens, pigs

and sheep from the community to access the CFP and consume feed meant for enclosed animals. Some of the water troughs were leaking causing muddy conditions that increased risk of foot-rot in animals. CFPs also lacked electricity. Consequently, data capture and storage at communal CFPs involved use of hand-written records kept in hard-copy notebooks. In some cases, former CFP supervisors had left employment and taken these hard copies of CFP records with them, affecting continuity of operations.

#### 4. Discussion

It is clear that CFPs represent a useful starting point in attempting to increase participation of communal farmers in market sales of cattle, but many issues are constraining them from realizing their full potential.

A key issue remains the very limited ability of communal CFPs to engage with the formal market, which is central to national agrarian support policies. A major limitation here is the highly rigid red meat carcass classification system in the formal system, which provides much lower prices for the older cattle that communal farmers sell. It appears that for this group of farmers, most of whom own non-descript crossbred and indigenous cattle (Marandure et al., 2016b), there is currently limited value in utilizing CFPs to channel animals into the formal marketing system. Some gains might be possible through more rigid enforcement of restrictions on age and sex of the animals at intake, but this would still not overcome the limitations imposed by animals being of mixed breed and might further discourage participation by some communal owners. Thus, unless alternatives to the current beef carcass classification are sought e.g. by developing a natural pasture-fed smallholder-produced beef brand (Marandure et al., 2016a) or establishing an alternative regional beef carcass classification system (Chingala et al., 2017), the motivation for even the larger communal producers will continue to be to use the communal CFPs as platforms to sell informally to other local buyers, thereby attaining higher prices.

Nonetheless, in terms of the objective of 'systematising' informal markets, it is clear that communal CFPs are successfully being used by some communal farmers to realize better cattle prices in the informal sector. CFPs have increased cattle offtake to over 16%, unlocking the exchange market value of cattle. CFPs are able to encourage wider participation by

communal farmers in the informal cattle market by complementing the way communal cattle production systems work. Specifically, enabling communal owners to sell older animals after they have already realized their non-income value, is important value addition to rural livelihoods. CFPs go beyond collective, co-operative marketing in smallholder systems, acting as systematised livestock hubs or 'geographical clusters' (Staal, 2015) which have the potential to enable a more consistent supply of cattle from the traditionally irregular offtake of smallholder farmers, if properly supported. Systematised informal marketing encourages vertical integration into organized markets through reduction of transaction costs (Staal, 2015).

However, it is also clear that many communal farmers, even those with cattle, are not engaging with CFPs. Rather, it appears that the benefits of CFPs are mostly being realized by male communal farmers, particularly those with larger herds and the ability to transport their animals to the CFPs – a form of rural elite capture. Mansuri and Rao (2004) found that most community-based projects in developing countries are successful in targeting poor communities but are less successful in targeting the actual poorer and marginalized households within those communities. Those respondents who appear to be most marginalized in terms of CFP engagement are from poorer (in terms of livestock holdings and livestock income) and female-headed households and there is considerable overlap between the two. Participation of women in livestock development initiatives of this type is often constrained by the strongly gendered nature of cattle ownership in African societies (Njuki & Sanginga, 2013). However, where women are *de facto* owners of cattle (e.g. widows who inherit cattle from their deceased husbands), more needs to be done to empower them to make independent marketing decisions that enable them to benefit directly from CFPs. CFPs should be encouraged to adopt gender transformative policies in their design (e.g. Chanamoto & Hall, 2015). Ensuring awareness among women of the purpose and function of the CFPs will be an important part of this. Many of the agricultural technicians seconded by government to support CFPs are women, hence they have the potential to play an important extension role in this respect. The exclusion of poorer households with relatively few cattle (and of course those with none) is an inevitable consequence of this type of government-driven

intervention, which naturally favours wealthier households with more cattle to dispose of. This underlines the need for complementary sets of interventions that address alternative livelihood sources such as poultry, small-stock and crop production, which might better assist these poorer households.

Interestingly, there are also other reasons for the lack of engagement of households with CFPs, which do not relate directly to wealth or gender, but rather to the level of perceived risk to livestock associated with CFP utilization (which tends to be higher amongst owners with fewer livestock) and a lack of understanding amongst some communal farmers of the main production objectives for creating the CFPs. The lack of understanding of the objectives of CFPs amongst communal cattle owners suggests a lack of clear communication of the role of CFPs by both government and the local institutions responsible for their operation. It also underlines a potential issue with knowledge ownership/capture by local elites, which enables these elites to be best-positioned to take advantage of CFPs based on their greater understanding of the 'rules of the game'.

Lack of participation due to perceived risk can be directly linked to challenges with CFP functioning, owing to the poor and disconnected government and stakeholder support, which results in greater levels of risk being borne by the communal farmers themselves. In communal CFPs that have experienced serious problems, particularly with animal death/theft without compensation, participation from neighbouring communities is low. Clearly, greater participation of communal livestock owners in CFP initiatives is contingent to some extent on reducing the perceived level of risk to cattle in the feedlot facility, and a key part of this will be ensuring there is the local capacity to ensure continuity of feed and water supply as well as adequate veterinary and animal husbandry support (see recommendations). There may also be the possibility of introducing a livestock insurance scheme at limited additional cost to participants, which would lower the risk for poorer households. Such schemes already exist at commercial feedlots in South Africa. Furthermore, Xiu, Xiu, and Bauer (2012), Khan, Chander, and Bardhan (2012) and Bishu et al. (2018) reported that over 60% of smallholder farmers studied in China, India and Ethiopia respectively, were willing to insure their cattle. Promoting knowledge and awareness of cattle insurance as a risk management strategy might encourage more farmers to participate in CFPs.

Significant differences between CFPs in farmer cattle sales, can be explained by differences in herd size, but might also be related to awareness of marketing opportunities. For example, farmers in Lower Hukuwa and Kamastone, as well as having large herds, seemed more aware of the benefits of marketing cattle, possibly through earlier marketing initiatives and contact with middlemen. Further research to understand in more detail what underpins this greater awareness of market opportunities will be important in terms of potential extrapolation to other CFP communities.

## 5. Conclusions and recommendations

This analysis of eight communal CFPs in Eastern Cape Province, underlines the potential they have in 'systematising' the sales of cattle into the local, informal market. However, there remain key challenges to their sustainability related to inadequate support from local and national institutions that are tasked to provision them, which contributes to limited participation by more marginalized groups of communal farmers and elite capture. We suggest that to overcome this will require a focus on two main areas.

### 5.1. Strengthening community participation in CFPs

The vital labour and feed subsidy elements of CFPs means that they remain vulnerable to changes in government support which affects their sustainability. The risk associated with CFPs is mainly due to lack of feed, which results in animal deaths and discourages participation from local communal farmers. Mitigating this risk might therefore involve CFPs and their associated communities playing a more active role in establishing alternative feed sources, such as using communal plots to grow crops for feed. CFP participants could potentially provide or pay for labour at the plots, while the CFP co-operative provides: (a) seed, fertilizer and agro-chemicals using the fixed fees contributed by participants; (b) manure from the CFP to fertilize the communal plots; (c) expertise in fodder crop management and feed formulation. This might also involve supplementation of feed using browse-tree leaves, grass hay from rangelands and crop residues. This approach also means that local communities are more closely integrated with CFPs, which promotes

communal ownership; sustainability of CFPs and continuous innovation. Building local capacity to continue to operate the CFPs is essential given that the official government support for the CFPs is only for a 5-year period beginning in 2013. This strengthening of community input must also be coupled with coherent and improved linkages with the governmental departments and associated institutions, such as NAMC, that support CFPs.

### 5.2. Widening participation of marginalized groups

Inclusion of women, youth and other marginalized groups in livestock development programmes remains a major challenge in communal areas. While CFPs might not have the scope to widen participation of women and youth through altering livestock ownership rights, there is certainly greater scope to ensure that female headed households with cattle are better supported to engage with CFPs. Women usually have power and ownership rights over small stock (Chanamoto & Hall, 2015), hence CFPs might become gender-transformative, inclusive and empower women by coupling marketing of cattle with marketing of small stock such as sheep. This is being trialled at Ngangeqjili CFP. According to Datta (2003, p. 362), the empowerment of women is often achieved through effective organization and grassroots activism, and '...in developing countries, where resources are scarce, government policy is often a necessity in empowering women'. For households with smaller cattle herds who may currently feel that the risk of placing their cattle in feedlots is too great, communal CFPs can try to mitigate risk by providing cattle insurance within the fees that farmers pay. This has already been successfully implemented at Ikhephu commercial CFP (servicing smallholders with access to private farms), also in Eastern Cape, which allocates a premium of ZAR100/animal of the standard fee paid by the farmer to cover livestock insurance in the event of cattle death/theft in the CFP. Communal CFPs can also widen participation by addressing the perceived lack of understanding of the main goals of CFPs by some farmers. Knowledge of what CFPs aim to achieve and how to participate must be clearly disseminated in communities by CFP representatives at general meetings to ensure membership is not elitist.

Poor institutional design has been demonstrated to allow elite capture in community projects and this

could be minimized by rethinking the institutions associated with CFP programmes to ensure more equitable resource distribution (Mansuri & Rao, 2004; Wong, 2010). Policy reforms that adopt 'co-opt elite' approaches (Wong, 2010) in the CFP committee selection process might be beneficial. For example, a 'co-opt elite' approach employed by a community water project in Uganda involved the mandatory selection of a representative from each of: (a) farmer's group, (b) chief or chiefs' council, (c) youth group, (d) religious or political group, (e) women's group; to the local committee and further required that 'at least one out of the three local representatives must be female' (Wong, 2010, p. 10). Such representation within CFPs, might help to increase the participation of women and other marginalized groups.

Thus, the next, critical step will be to learn from the operational and social constraints that have been identified with the current CFP model and for it to be rethought on a more inclusive and sustainable basis. Only then can its full potential for improving household income amongst smallholder cattle farmers within South Africa, and possibly beyond, be effectively realized.

## Notes

1. ZAR is the official South African currency, the South African Rand. The current official exchange rate (as at 01 September 2018) of 1 South African Rand equivalent to 0.077 United States Dollars was used to convert ZAR to US\$.
2. Middlemen are people who purchase livestock from farmers and sell them to traders, retailers or consumers, 'linking farmers to traders and final markets' (Abebe, Bijman & Royer, 2016).

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