

Management practices and contribution of village chickens to livelihoods of communal farmers: The case of Centane and Mount Frere in Eastern Cape, South Africa

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Abstract. Gunya B, Muchenje V, Gxasheka M, Tyasi LT, Masika PJ. 2020. Management practices and contribution of village chickens to livelihoods of communal farmers: The case of Centane and Mount Frere in Eastern Cape, South Africa. *Biodiversitas* 21: 1345-1351. This study was conducted to determine village chickens production practices and their contribution to the livelihoods of farmers in rural households of the Eastern Cape Province, South Africa. Data were gathered using a questionnaire survey of 150 households, which were identified by the use of snowball sampling. Village chickens were the most livestock species kept by farmers, mostly owned by women (79.61% in Centane and 81.06% in Mount Frere) and were kept for household food needs. Some farmers (21.92% and 25.31%) also occasionally sold their chickens at an average of R80 (\$7.22) per bird. Most (93.13% and 76.44%) chickens flocks were provided with supplementary feed. The majority of farmers (80.31% and 88.33%) provided shelter for their chickens. The causes of chicken losses were reported to be diseases, predators, parasites and theft. The most cited disease problem was Newcastle (50.32% and 66.02%) while major predators were eagles (84.91% and 81.82%). The most common internal parasites were roundworms and tapeworm whilst the most reported external parasites were poultry lice and mites. The majority of farmers (94.51% and 92.21%) reported using chicken manure to improve the fertility of soils in their gardens. Chickens had a varied social role in the two areas, i.e., donation (61.63% and 68.82%) to neighbors and relatives. The majority of farmers (84.90%) in Centane didn't use chickens for cultural purposes whilst the majority (55.85%) in Mount Frere used chickens for cultural purposes. The present study showed that village chickens have a contribution to the livelihoods of rural households.

Keywords: Communal farmers, livelihoods, management, practices, village chickens

INTRODUCTION

Village chickens are the most common type of livestock in many rural areas in South Africa. They are reared under the extensive system. They are among the most adaptable domestic animals that can survive in harsh environments. Nevertheless, village chicken production is based on extensive farming which is characterized by low productivity and poor management. They are maintained with few or no inputs for housing, feeding and health care (Muchadeyi et al. 2004). Furthermore, they obtain most of their diet by scavenging for food and water around the home and village. They are prolific, easily reared and their output can be generally expanded more rapidly and easily than other livestock (Reta 2009).

Village chickens play an important role in poverty alleviation of rural farmers (Fattah 1999; Aklilu et al. 2008) by providing a cheap source of protein, in the form of meat and eggs (Adongo 2004; Copland and Alders 2005; Mack et al. 2005). Rural poultry has also been reported to play a significant role in income generation. They also contribute to socio-cultural functions such as traditional ceremonies, hospitality and exchange gifts to strengthen relationships

(Aklilu et al. 2008). Hence, they contribute significantly to the livelihoods of people who keep them.

Village chickens are important, despite their poor production, in providing valuable high-quality protein, poverty alleviation and income and food security. Despite their importance, village chickens are sometimes ignored. Therefore, there is lack of information on the status of chicken production and contribution of village chickens to the livelihoods of most communal households of South Africa. This study will facilitate the understanding of the significance of village chickens and also outline the challenges that farmers face. Therefore the objective of this study was to evaluate the village chicken production system and to estimate their role to rural households.

MATERIALS AND METHODS

Study area

The study was conducted in two Municipalities: Amathole District Municipality and Alfred Nzo District Municipality in Eastern Cape Province of South Africa (Figure 1). In Amathole District Municipality, the study

was conducted in the villages of Centane which is in Umnquma local municipality. It lies along longitude 28° 31'6"E and latitude 32°51'67"S at an altitude of 456m above sea level. This area forms part of the coastal Eastern Cape which is characterized by high regular rainfall throughout the year (700-1000 mm/ annum) with most rains occurring in spring and summer months (October to March) particularly in the lowland coastal belt, extending 30 to 60 km inland (Mwale and Masika 2009). In winter, the average minimum temperature is 7°C while the maximum temperature is 21°C. In Alfred Nzo District Municipality, the study was conducted in villages of Mount Frere which is in Umzimvubu local municipality which lies along longitude 28° 9'33"E and latitude 30°9'167"S at an altitude of 1 321m. This area is situated far from the coast which is characterized by low rainfall throughout the year mean annual rainfall of 671 mm, with most rainfall occurring mainly during midsummer. It receives the lowest rainfall (7 mm) in June and the highest (110mm) in January. The annual temperature ranges from 18.3 °C in June to 25.9 °C in January. The region is coldest during July when the temperature drops to 3.7 °C (Phininzi and Ngetar 2017).

Sampling procedure

Snowball sampling technique was used to select 150 households that were interviewed in two villages of Centane and three villages of Mount Frere, the respondents were asked to give referrals to other persons believed to fit the study requirements. Only those farmers who owned chickens and willing to participate in this study were considered. The studied villages were chosen by the researchers with the help of extension officers. The chosen five villages had significant number of households farming with chickens.

Data collection

The questionnaire was pre-tested before use in the survey. A total of 150 structured questionnaires were administered by a personal interview with households that owned village chickens in selected villages. Information on management practice and contribution of chickens to the livelihoods of farmers was collected under the following categories: demography information, livestock inventory, chicken nutrition, diseases and parasites, housing and roles of chickens.

The majority (49.31%) of households were male-headed in Centane whereas in Mount Frere were female-headed (58.42%) as shown in Table 1. The majority of chicken farmers were female farmers, 54.42% and 64.94%, at Centane and Mount Frere, respectively. About 69.86% and 57.14% of farmers at Centane and Mount Frere respectively, were married. The educational background of the majority farmers (41.09%) at Centane was secondary level followed by tertiary level (36.98%) while at Mount Frere was primary level (45.45%) followed by secondary level (32.48). The highest (64.44% and 67.54) household size was less than five. Table 1 shows that 86.29% of participants at Centane and 51.95% at Mount Frere were not employed followed by pensioners.

Data analysis

The frequencies of demographic characteristics (age, gender, education, marital status, employment status, household size) of selected farmers were determined using Proc Freq of SAS (version 9.1.3). Chi-square test was used to determine degree of association between categorical variables: demographic, management practices and roles of village chickens.

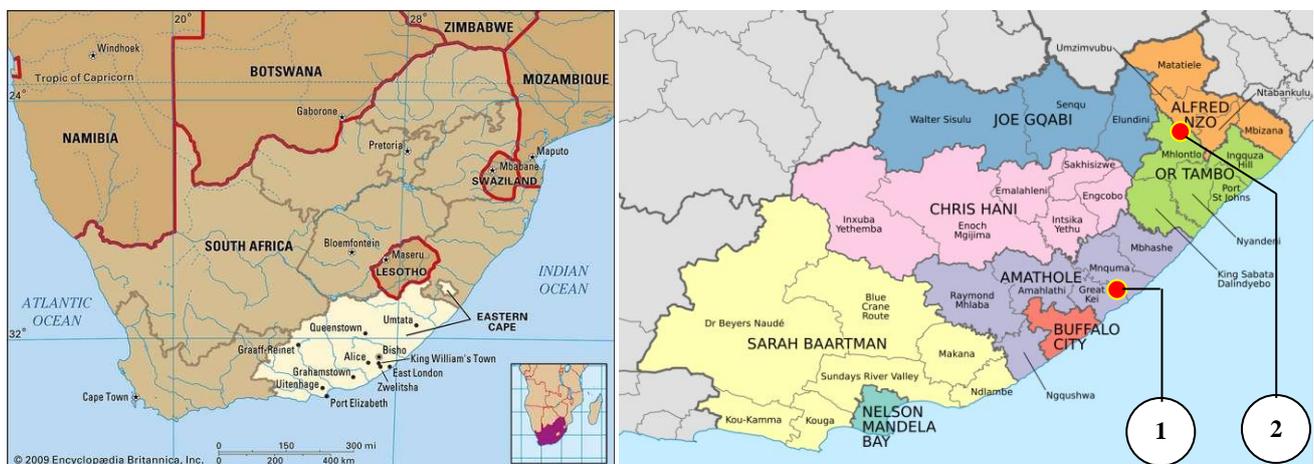


Figure 1. Locational map of Centane (1) and Mount Frere (2), Eastern Cape Province, South Africa

Table 1. Demographic characteristics of household head chicken farmers in Centane and Mount Frere

Characteristics	Class	Centane		Mount Frere	
		%	Freq	%	Freq
Head of the family	Father	49.32	36	36.38	28
	Mother	38.36	28	58.42	45
	Children	12.32	9	5.20	4
Gender	Male	46.58	34	35.06	27
	Female	54.42	39	64.94	50
Age	<20 yrs	5.34	4	0.00	0
	21-40 yrs	16.43	12	12.99	10
	41-60 yrs	41.09	30	45.45	35
	>60 yrs	36.99	27	41.55	32
Education	No formal	28.76	21	18.18	14
	Primary	32.87	24	45.45	35
	Secondary	41.09	26	32.48	25
	Tertiary	36.98	2	3.89	3
Marital status	Single	42.20	15	35.42	4
	Married	69.86	51	57.14	44
	Widow	9.59	7	24.68	19
Household size	<5	64.44	47	67.54	52
	6-10	32.87	24	57.15	23
	11-15	2.73	2	2.59	2
Employment	Not employed	57.53	42	53.34	40
	Informal	2.74	2	5.33	4
	Employed	6.85	5	5.33	4
	Pensioner	32.88	24	35.00	27

RESULTS AND DISCUSSION

Livestock inventory

Village chickens were the most livestock species kept by farmers in Centane and Mount Frere, followed by cattle, sheep, goats, pigs, geese, and ducks (Figure 1). Furthermore, chickens were ranked as the most important livestock by most farmers in both study sites. Chickens were mainly kept for consumption of 68.95% and 74.54% at Centane and Mount Frere, respectively, however, few farmers (1.38% and 2.61%) used their chickens for sales. On the other hand, cattle were mainly kept for sales or as a bank (19.31%) in Centane whereas in Mount Frere were for draft power (16.99%). Sheep were mainly kept for sales (23.44%) in Centane whereas were kept for wool production (9.81%) in Mount Frere. Moreover, goats were mainly kept for cultural rituals (22.68% and 39.23%) in both communities.

Ownership

Although chickens belong to the family at large, specific patterns of ownership were observed as shown in Figure 2. Women-owned the majority of chickens (78.61% and 81.06%) in Centane and Mount Frere, respectively. Most of farmers (53.829% and 45.76%) in Centane and

Mount Frere sourced their chickens through buying, whereas few obtained them as a gift. In Mount Frere a very proportion (1.31%) obtained their chickens through exchanging.

Diseases and parasites

Diseases were reported to be the major causes of chicken losses, in both study sites. Newcastle disease was perceived to be the most common followed by Marek's disease and diarrhea (Table 2). Most of the respondents (99.31% and 85.01%) used ethnoveterinary medicines specifically Aloe to control diseases.

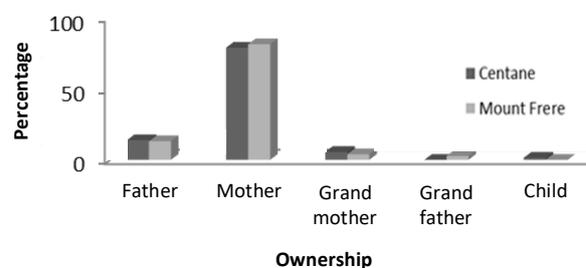
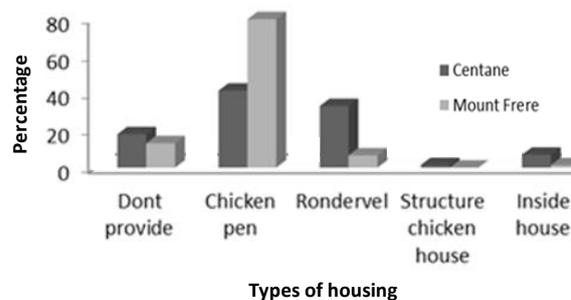
**Figure 1.** Average livestock ownership in Centane and Mount Frere, South Africa**Figure 2.** Ownership of chickens in Centane and Mount Frere, South Africa**Figure 4.** Kind of housing provided for chickens in Centane and Mount Frere, South Africa

Table 2. Disease, predation and theft in Centane and Mount Frere, South Africa

Attributes	Centane (%)	Mount Frere (%)
Diseases		
New Castle	50.31	66.02
Marek's	12.53	19.62
Diarrhea	11.03	13.07
Other diseases	26.13	1.29
Predation		
Eagles	84.91	81.83
Cats and dogs	8	8
Wild animals	7.09	10.18
Theft		
Yes	57.53	28.56
No	42.47	71.44

In Centane, chicken tapeworms were the main internal parasites whilst in Mount Frere, it was roundworms. Internal parasites were prevalent during the summer season, although some farmers were not aware of the existence of internal parasites in chickens. Farmers who controlled internal parasites used mainly Aloe (53.77% and 18.27%) whereas the rest did not use any control.

The majority of farmers reported experiencing problems with external parasites in their chickens. In both communities, mites were the most common external parasites followed by lice. External parasites occurred mostly during the summer season. Farmers reported that they use wood ash, blue death, and chicken spray dip to eliminate external parasites from chickens.

Predation

Most of the respondents reported chicken predation to be a concern. Eagles were the most common predators (Table 2) that were found at Centane and Mount Frere, respectively. Cats and dogs were also a problem as recorded by 8% of the respondent of both the study sites. To control chicken predation farmers enclosed their chickens in chick net (46.66% and 64.00%). Farmers control predation by eagles by shouting at them (26.03% and 36.37%).

Theft

The theft was reported to be a problem by 57.53% of chicken farmers in Centane, whereas some farmers (71.44%) from Mount Frere did not (Table 2). In Centane some of the farmers (24.65%) minimize theft of chickens by sleeping with them inside their houses, while farmers (12.99%) in Mount Frere reported that they used dogs.

Housing

The majority of chicken farmers (80.81% and 88.33%) provided shelter for their chickens whilst the rest (19.17% and 11.69%) did not, at Centane and Mount Frere, respectively. The chicken pen was the most (40.09% and 9.09%) type of housing provided by farmers for their chickens while structured chicken houses were the least. Few farmers (30%) did not provide houses for their chickens. Their chickens (12.33% and 7.79%) roosted

inside the houses at night to prevent theft and others in kraal (4.11% and 1.31%), open space (1.38% and 2.59%) and trees (1.38% and 0) at Centane and Mount Frere, respectively.

The major challenge (41.09% at Centane and 45.39% at Mount Frere) faced by chicken farmers to house their chickens was cleaning the chicken houses followed by no proper housing (12.32% and 10.38%) theft (10.95% and 0%), external parasites (5.48% and 6.47%), predators (0.0% and 5.34%) and brooding place (1.38% and 1.31%). Some farmers (60.00%) reported not having challenges concerning housing chickens.

Contribution of chicken to nutrition

All the respondents (100%) in both sites kept village chickens to address the food needs of their households. Farmers in Centane normally consumed chickens monthly, whilst in Mount Frere consumption of chickens was rarely done. In both Centane and Mount Frere, most farmers (60.26% and 57.14%) reported that they consume one chicken at a time. Consumption of eggs varied, the majority of respondents (86.38% and 80.52%) ate eggs from village chickens, though few (26.03% and 19.48%) did not. The major factor influencing egg consumption was that it would reduce the number of eggs for incubation. Although some farmers consume eggs from the village chickens, most cease from doing so to provide as many eggs as possible for incubation. Other reasons farmers reported for not consuming eggs were yellowness of egg yolk, number of chickens and age of chickens.

Contribution of chickens to economics

The majority of chicken farmers (78.07% and 87.03%) did not sell chickens at Centane and Mount Frere. The reasons for not selling chickens were having few chickens, keeping them for consumption only, and not having a market. However, there were few farmers (21.92% and 12.99%) who occasionally sold some of their chickens within the community. The major reason for selling chickens was the need for cash. The prices of the chicken were at an average of R80 (\$7.22). Most of the farmers (97.24% and 97.41%) did not sell eggs, manure and feathers because there were no markets.

Contribution of chickens to socio-cultural

The majority of farmers (94.51% and 92.21%) applied chicken manure to improve the fertility of their vegetable gardens, instead of using organic fertilizers. Some farmers did not use chicken manure because: they did not collect manure, did not have a garden, used kraal manure instead, and lacked the necessary knowledge. Most of farmers (61.63% and 68.82) in Centane and Mount Frere donated their chickens to their neighbors and relatives. Some farmers (38.36% and 31.17%) did not donate chickens because their chickens were few. The majority of farmers (84.90%) in Centane didn't use chickens for cultural purposes. Farmers in Centane reported that they use goats and cattle to perform their rituals not chickens. However, the majority (55.85%) in Mount Frere used chickens for cultural purposes.

Discussion

Village chickens were the most livestock species kept by farmers, finding in line with the results by Mwale and Masika (2009) and Mutibvu (2012). This shows that every household owned a chicken (Mwale and Masika 2009). Furthermore, chickens were ranked as the most important livestock by most farmers in both study sites. Similar results have been reported by Mutibvu (2012) and Nyoni and Masika (2012). This happened because some farmers might not own other livestock or the number of other livestock (cattle, sheep, goats, pigs, geese, and ducks) was fewer as compared to chickens, hence village chickens were regarded as very important livestock.

Ownership of chickens was predominantly by women. This may be attributed to the role played by women on poultry management activities such as cleaning, feeding, and watering. In addition, men own and control large animals (cattle, goat, and sheep) and chickens are directly accessible to women. However, men tend to be involved in chicken production when the enterprise becomes large while women tend to be largely confined to production at a subsistence level (Mtileni et al. 2009). This finding is in agreement with reports of Muchadeyi (2004), Halima (2007), Abubakar et al. (2007), Moges et al. (2010) and Mtileni et al. (2009), who observed that women were more responsible for the chicken management.

Supplementary feed was provided in the form of maize grain to improve the nutrition of their birds absolutely to enhance the rapid growth rate and weight gain. The use of maize grain as a supplement may be attributed to easily availability of maize to farmers since maize is the most common available crop in the Eastern Cape Province. The provision of feed supplementation for village chickens specifically maize was also reported by Muchadeyi et al. (2004), Mwale and Masika (2009), and Nyoni and Masika (2012). Chickens were fed separately based on their different stages of growth to prevent competition between old birds and chicks. This finding contradicts the results found by Muchadeyi et al. (2004) and Nyoni and Masika (2012), who reported that chickens at different stages of growth were left to compete for the same feed. Most farmers did not provide protein feed for their chickens presumably because the communal farmers cannot afford to purchase them due to their expenses. Chickens scavenged for their protein source on grass, worms, and insect. Protein-rich materials such as earthworms, insects, and grass can help to meet the need for protein of birds.

Diseases were the major causes of chicken losses. This may be due to poor housing, poor hygiene and inadequate feeding which predispose chickens to diseases (Selam and Kelay 2013). Diseases become a problem when drugs and vaccines are not easily accessible to farmers. Similar findings have been reported by Mtileni et al. (2009) and Dinka et al. (2010), that Newcastle was the most problematic disease. Chicken death rates were highest during summer season. This finding is similar to the work done by Dinka et al. (2010), who reported that Newcastle was mostly prevalent during rainy season (June to August). Internal parasites were also a problem for chickens. Major factors associated with the high prevalence of internal

parasite infestation are the type of production system which is basically a free-ranging, low-input low-output that allows the chickens to easily pick up infections (Mwale and Masika 2009). This was also substantiated by Muchadeyi et al. (2007), who specified that in extensive management systems where chickens have access to outdoor areas, and not confined, chickens have a greater diversity of parasite infestations. Most of farmers used Ethno-Veterinary medicine specifically aloe to control diseases and internal parasite.

In both communities, mites were the most common external parasites followed by lice. This result is in agreement with the finding of Nnadi and George (2010). Lice and mites can cause chick mortality attributed to starvation and immune depression infestation (Nnadi and George 2010). External parasites result in slow growth rates and reduced egg production of chickens (Gabanakgosi et al. 2012). Furthermore, predation was anxiety for farmers. Eagles were the most common predators, finding contradicts the results by Dinka et al. (2010), who found snakes, rats, dogs and foxes were the main predators. This challenge of predation can be resolved through monitoring chickens during scavenging period (Mapiye et al., 2008), and constructing proper housing for chickens (Kusina et al. 2004; Selam and Kelay 2013). Village chickens were housed, though the housing was not proper, a finding in agreement with results found by Mwale and Masika (2009) and Nyoni and Masika (2012). Good housing is needed to reduce losses of chickens from predators, diseases and extreme weather conditions (Kusina et al. 2001).

The current study agrees with many studies (Muchadeyi et al. 2007; Mwale and Masika 2009; Nyoni and Masika 2012), that indicated that the major reason for keeping village chickens is to provide a source of protein in the form of meat and eggs. This may be attributed to the fact that village chicken meat is highly favored by consumers because of its taste, texture, leanness, suitability for special dishes (Mtileni et al. 2009), and less fat accumulated in carcasses of indigenous chickens as compared to hybrids (Tarwireyi and Fanadzo 2013). Furthermore, chickens can be slaughtered more easily for consumption than other livestock and can be easily stored (Mwale and Masika 2009). Farmer consumed one chicken per time. The number of chickens consumed per time depends on the size of family, and in this study, the highest household size was less than five. This could explain why one chicken per time was consumed in both study sites. Moreover, consumption of one bird may be ascribed to the few numbers of chickens farmers had. Although some farmers consume eggs from the village chickens, most refrain from doing so, to provide as many eggs as possible for incubation. This result is inconsistent with Moreki et al. (2010), who reported that farmers did not consume eggs but used them for breeding. Although chickens were mainly kept for consumption, some farmers occasionally sold some of their chickens within the community, a finding consistent with the results reported by Nyoni and Masika (2012). This study is in contrast with the findings of Moges et al. (2010) and Zwedu et al. (2013), who reported sales of village chickens were the main reason for rearing chickens.

Chicken manure was applied to vegetable gardens to enrich the fertility of soils in their gardens. This concurs with the results found by Muchadeyi et al. (2004), Nyoni and Masika (2012) and Ndiweni (2013). Chicken manure is considered to be the best for vegetables than goat and cattle manure (Mapiye et al. 2008). In addition, poultry manure is a rich source of nitrogen and organic manure which helps to improve crop production (Ndiweni 2013). Chickens were used as donation to neighbors and relatives, a finding in line with results of Nyoni and Masika (2012) and Gabanakgosi et al. (2013). Donation of chickens is expressed by many words including care, love, support, teamwork, sharing, socialization, pass-on-gift, togetherness, encouragement, appreciation and self-reliance (Gabanakgosi et al. 2013). In this study, farmers donated with their chickens to encourage their neighbors with farm village chickens. Chicken farmers in Centane didn't use chickens for cultural purposes, a finding in agreement to reports by Mwale and Masika (2009) and Nyoni and Masika (2012). However, in Mount Frere chickens were used for cultural purposes, consistent with the findings by Mafu and Masika (2003), Moreki (2006) and Mack et al. (2005). This may be attributed to the fact that village chickens are easily available as sacrificial for various cultural functions (Mwacharo et al. 2013).

The results of the current study show that village chickens play an important role in the livelihoods of farmers in South Africa, mostly on the provision of food in the form of meat and eggs. Diseases specifically Newcastle were major causes of chicken loss; hence there is a need to prevent and control this disease through vaccination. Parasites, predation, and theft were also the causes of chicken losses in Centane and Mount Frere. Improvement in management of poultry housing, feeding, and animal health care will increase village chicken productivity significantly.

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