

Characterization of Donkey Husbandry Systems in Four Peri-urban Communes in the Central Region of Burkina Faso

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SUMMARY

The donkey is an essential working animal in family farms across Burkina Faso. However, knowledge of donkey husbandry systems and management practices remains limited. This cross-sectional study was conducted from April to July 2026 in four communes of central Burkina Faso (Komsilga, Koubri, Pabré, and Saaba). Data were collected from 100 donkey keepers selected using a snowball sampling approach through a structured survey. Descriptive statistics, Multiple Correspondence Analysis (MCA), and Hierarchical Cluster Analysis (HCA) were used to characterize donkey husbandry systems and identify keeper profiles. The results showed that donkey owners were predominantly men (71%), mostly farmers (83%), and generally owned small herds (78%). All respondents practised extensive husbandry and used natural pasture, harvested forage, and crop residues. Donkeys were used mainly for transport (99%) and field work (96%), while none of the respondents reported keeping donkeys for breeding purposes. Keepers did not recognize distinct breeds but differentiated animals by coat colour, with the local term *tampouré* (grey coat) predominating (82%). Multivariate analysis identified three distinct keeper profiles, differentiated by age, experience, location, and management practices. These findings underline the socio-economic importance of the donkey, highlighting the need to improve management practices for the conservation of local donkey genetic resources.

Keywords: Donkey; husbandry; characterization; typology; Burkina Faso.

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INTRODUCTION

For centuries, the donkey has accompanied human societies as an indispensable working animal (Yilmaz and Wilson, 2013). Across many regions of Africa, it plays a crucial role in agriculture and the transport of goods and people, and contributes to the food security of marginalized households (Geiger et al., 2020). The donkey is valued for its ability to carry heavy loads over long distances, to plough land, to adapt to a wide range of terrains and climatic conditions, and for its low maintenance costs (Bemji et al., 2026). These traits make it a major asset, particularly in the rural and peri-urban areas of developing countries (Tapsoba, 2012).

Despite its many positive qualities, the donkey is often considered a minor livestock species (Hassan et al., 2013; Kaboret, 2014). This translates to a limited number of scientific studies. In fact, there is relatively little published research on donkey production systems, management practices and genetic resources. Consequently, important knowledge gaps remain regarding the characterization and sustainable management of donkey populations in many African countries, including Burkina Faso.

At a time when improving local genetic resources has become a priority, it is essential to document husbandry practices, production objectives, and the roles assigned to donkeys. This documentation captures local knowledge and supports the development of a typology of husbandry systems. Such a typology helps identify keeper profiles, their

constraints and expectations, as well as the social, economic, and cultural functions of the donkey. Such an approach is essential for designing appropriate interventions such as community-based breeding programmes (CBBPs) and for promoting the sustainable management of this often-overlooked animal resource.

Materials and Methods

Study area

This study was conducted from April to July 2026 in four peri-urban communes surrounding Ouagadougou, the capital of Burkina Faso: Saaba, Komsilga, Pabré, and Koubri (figure 1). These communes were selected because of their important role of donkeys in agricultural activities, transport, and other peri-urban livelihoods. In 2020, donkey populations were estimated at 7214, 7,214, 9,953,

and 12,985 animals in Saaba, Komsilga, Pabré, and Koubri, respectively (DGD, 2022). All of these localities lie within the Sudano-Sahelian agroecological zone and share climatic conditions typical of the broader Centre region, which is characterized by low and variable rainfall (Ouandaogo, 2008). Agriculture and livestock rearing are the primary subsistence activities in the area.

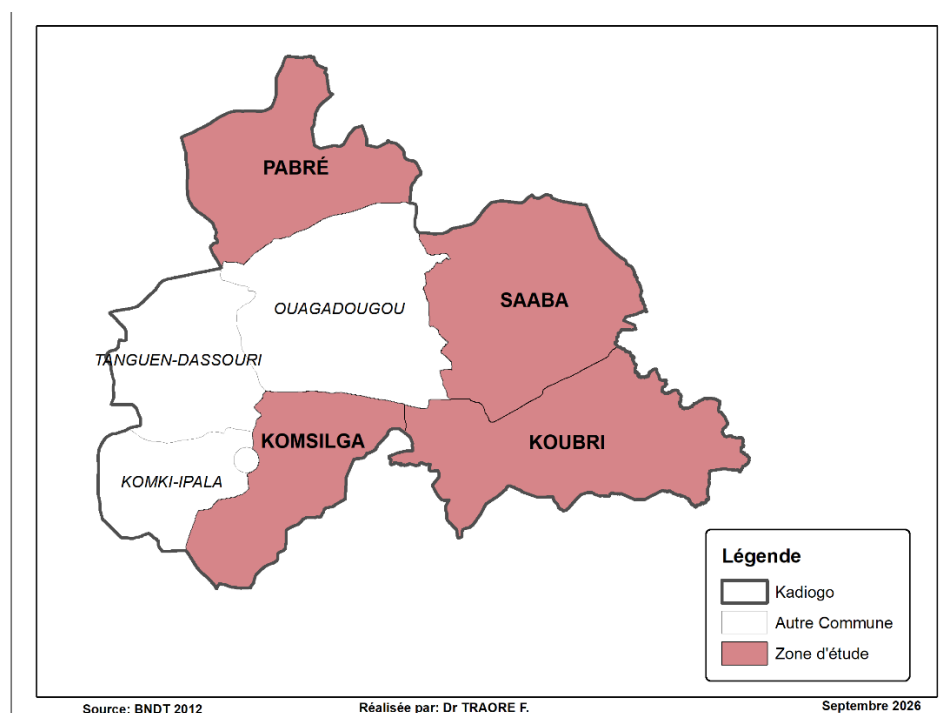


Figure 1: Map of the Study Area

Ethical considerations

The study protocol was approved by the municipal authorities responsible for livestock farming in the study area. Participation was voluntary, and informed consent was obtained from all

respondents prior to data collection. For the single participant under the age of 18, interviews were conducted in the presence of a parent or legal guardian.

Data collection

Data were collected from 100 donkey keepers, with 25 respondents surveyed in each commune. Sampling was carried out using the "snowball" method, with the support of local veterinary services. The primary eligibility criterion was ownership of at least one donkey. Initial owners were identified with the help of veterinary services, and subsequent participants were recruited through their networks until the target sample size was reached. The sample size of 25 donkey owners per commune was selected based on the homogeneity of livestock production systems and management practices observed within each commune. Preliminary surveys revealed a high degree of similarity in practices among donkey owners. Therefore, beyond a certain sample size, increasing the number of respondents provided limited additional information, as responses tended to become repetitive.

A cross-sectional survey was conducted to collect the required information using a structured questionnaire developed in accordance with the objectives of the study. The questionnaire captured the socio-economic profile of keepers (sex, age, marital status, occupation, etc.), as well as characteristics of their husbandry practices, including herd size, management system, and type of shelter used. The survey tool also covered health problems, reproduction, production objectives, and the main difficulties encountered by keepers. The questionnaire was prepared in French and translated into Mooré, the local language commonly spoken by the respondents, and was pretested to assess its clarity and comprehensibility. The survey was conducted face-to-face by a single trained

interviewer, who administered the questionnaire in either French or Mooré according to the respondent's preference. The information collected was mainly self-reported, while some information on animals and housing facilities was directly verified during the visit. Questionnaires were checked for completeness and consistency to ensure the quality of the collected data.

Statistical analysis

Statistical analyses were performed using R software, version 4.6.1. The data were entered and cleaned using Microsoft Excel 2013 before statistical analysis. Data were checked for completeness and consistency, and missing data were identified during this verification and excluded from the relevant analyses. Age, experience in donkey husbandry, and herd size were categorized into classes for analysis. Health problems were identified from the keepers' own reports. For questions allowing multiple responses, each response was considered separately; consequently, the percentages for these questions could exceed 100% when summed. Descriptive statistics were first generated to identify the main trends and characteristics of the donkey herds surveyed. Chi-squared tests were used to compare the distribution of variable categories across communes. Significance threshold of $P < 0.05$ was applied. Finally, multiple correspondence analysis (MCA), followed by hierarchical cluster analysis (HCA), was applied to build a typology of the husbandry systems. These analyses were carried out using the FactoMineR package in R (Lê et al., 2008). Ten main variables were retained to construct this typology (Table 1).

Table 1. Variables used for the Multiple Correspondence Analysis (MCA)

Variable	Modalities	Code
Commune	Komsilga Koubri Pabré Saaba	Komsilga Koubri Pabré Saaba
Sex	Man, Woman	Man, Woman
Age (years)	12-40 41-60 61-71	Young, Adult, Senior
Education level	Educated, No education	Educated, None
Main activity	Farming, Livestock keeping, Other, Trading	Farming, livestock Other, Trader
Number of donkeys	Low Medium High	Low Medium High
Donkey-keeping experience (years)	1-10 11-30 >30	Begnr Interm Expert
Veterinary consultation	No Yes	No Yes
Owner	Head of household Spouse	Head Spouse
Production objectives	Transport Field work Transport and field work	Trans Fwork TransFwork

RESULTS

Socio-economic and Husbandry Characteristics of Donkey Keepers

The socio-economic and husbandry characteristics of donkey keepers and their herds are presented in

Table 2, providing an overview of the demographic profile of keepers, their occupational background, and the main characteristics of donkey husbandry across the study areas.

Table 2. Socio-economic and husbandry characteristics of donkey keepers by commune (%)

Variable	Modalities	Komsilga	Koubri	Pabré	Saaba	Total	p-value
Socio economic characteristics of donkey keepers							
Sex	Male	68	80	80	56	71	0.186
	Female	32	20	20	44	29	
Age (years)	12-40	32	28	20	44	31	0.015
	41-60	56	36	72	52	54	
	61-71	12	36	8	4	15	
Ethnic group	Mossi	100	96	100	96	98	0.564
	Fulani	0	4	0	4	2	
Education level	None	20	56	28	48	38	0.029
	Educated	80	44	72	52	62	
Marital status	Married	100	100	96	96	98	0.564
	Single	0	0	4	4	2	
Donkey owner	Head of household	72	96	96	56	80	<0.001
	Spouse	28	4	4	44	20	
Main occupation	Farming	100	84	96	52	83	<0.001
	Trade	0	4	4	32	10	
	Livestock keeping	0	4	0	4	2	
	Other	0	8	0	12	5	
Husbandry characteristics							
Husbandry experience (years)	1-10	28	52	16	84	45	<0.001
	11-30	56	32	84	12	46	
	31-45	16	16	0	4	9	
Herd structure and composition							
Herd size	1-2	72	80	76	84	78	0.354
	3-4	20	20	24	16	20	
	5-7	8	0	0	0	2	
Herd sex composition	Males only	28	40	68	80	54	0.001
	Females only	20	36	12	8	19	
	Mixed	52	24	20	12	27	
Foal present in herd	Yes	28	36	24	16	26	0.4
	No	72	64	76	84	74	

Respondents were predominantly men (71%). Although the distribution by sex did not differ significantly across communes, Saaba showed a comparatively more balanced ratio, with 54% men and 46% women. The age group with the highest representation was 41–60 years (54%), followed by the group of 12–40 years (31%) and the group of more than 60 years (15%). The distribution of age groups varied significantly by commune ($p = 0.015$), with notably lower proportions of keepers older than 60 years in Pabré and Saaba. The surveyed population was overwhelmingly Mossi (98%), with no significant difference between zones ($p = 0.564$). Overall, 62% of respondents were literate, compared with 38% who had no formal education. A significant difference was observed between study areas ($p = 0.029$), with higher proportions of non-literate respondents in Koubri (56%) and Saaba (48%). Farming was the main occupation of respondents (83%), followed by trade (10%), while donkey keeping itself was reported as a secondary activity by the vast majority (97%). Experience in donkey husbandry differed significantly across sites ($p < 0.001$): overall, intermediate-experience keepers formed the largest group (46%), followed by beginners (45%) and experts (9%). Beginners were particularly common in Saaba (84%) and Koubri (52%), whereas intermediate-experience keepers predominated in Pabré (84%) and Komsilga (56%). Finally, most keepers (78%) held small herds of 1-2 animals, 20% held medium-sized herds (3-4 animals), and only 2% held large herds (5-7 animals). These herds were mostly single-sex: 54% consisted of males only and 19% of females only. It should be noted that most of these herds consisted of just one individual. The sex composition of the herds varied significantly by commune, with Pabré and Saaba

showing a strong predominance of male-only herds. Foals were present in only 26% of herds at the time of the survey.

Donkey husbandry practices, uses, and management

Table 3 summarizes the main uses of donkeys, feeding practices, husbandry systems, reproductive management, and health-related constraints and practices across the four study areas.

Main uses of donkeys by study area

Donkeys were kept primarily for transport, reported by 99% of respondents, and field work, reported by 96%. Transport use was near-universal across all sites, reaching 100% in Komsilga, Koubri, and Pabré, and 96% in Saaba, with no significant difference between communes. Field work was reported by all keepers in Komsilga, Koubri, and Pabré, but by only 84% of those in Saaba, with a significant difference between communes ($p = 0.013$).

Notably, no keeper reported using donkeys for breeding purposes.

Husbandry systems

Donkey husbandry was exclusively extensive in all study areas (100%), and all respondents used natural pasture (100%).

In addition to grazing natural pasture directly, keepers also harvested forage to feed their animals. Crop residues were another important feed resource, used by 98% of keepers. Finally, 91% of respondents used supplementary feed such as local bran, and 7% used brewers' grain.

Table 3. Characteristics of donkey husbandry and use practices by commune (%)

Variable	Modalities	Komsilga	Koubri	Pabr�	Saaba	Overall	p-value
Main uses of donkeys							
Use for field work	Yes	100	100	100	84	96	0.013
	No	0	0	0	16	4	
Use for transport	Yes	100	100	100	96	99	
	No	0	0	0	4	1	
Feeding practices							
Feed	Natural pasture	100	100	100	100	100	0.242
	Harvested forage	100	100	100	100	100	
Supplementary feed	Crop residues	100	100	92	100	98	
	Local bran	92	96	84	92	91	
	Brewers' grain	8	4	8	8	7	
Local phenotypic identification and reproductive management							
Local donkey name	Bonpelga	0	0	0	4	1	0.041
	Bonsablega	4	0	0	12	4	
	Tampour�	80	96	92	60	82	
	Tampourpelga	0	0	0	4	1	
	Zabi	28	32	16	24	25	
Reproduction control	Yes	0	0	0	4	1	1
	No	100	100	100	96	99	
Husbandry constraints and veterinary service utilization							
Veterinary consultation	Yes	48	12	24	44	32	0.017
	No	52	88	76	56	68	
Feed constraint	Yes	96	100	100	100	99	1
	No	4	0	0	0	1	
Health constraint	Yes	96	100	96	92	96	0.9
	No	4	0	4	8	4	
Health problems identified by donkey owners							
Health problems	Skin	36	24	36	28	31	0.74
	Parasitic	40	52	44	56	48	0.66
	Respiratory	40	36	16	32	31	0.275
	Digestive	4	40	8	24	19	0.004

Genetic resources and reproduction management

Respondents recognized only one donkey breed in the study area. Animals were distinguished mainly by coat colour, with each coat type identified by a local name in the Mooré language. The most frequently cited term was tampouré (grey coat), reported by 82% of keepers. The term zabi (bay coat and its variants light bay, dark bay, etc.) was cited by 25% of keepers. The term bonsablega (black coat) was reported by 4% of respondents, mainly in Saaba, while bonpelga (white coat) and tampourpelga (dark grey coat) were the least cited, each mentioned by only 1% of respondents. The distribution of local names varied significantly between study communes ($p = 0.041$), reflecting a diversity of local terminology across geographic areas. Reproduction control was almost entirely absent among the herds surveyed: 99% of keepers reported practising no control over mating, and only 1% of respondents, located in Saaba, reported doing so.

Main constraints and health management

Keepers reported two main constraints: feed-related difficulties, cited by 99% of keepers, and health-related difficulties, cited by 96%. Feed constraints were reported by all keepers in Koubri, Pabré, and Saaba (100%), and by 96% of those in Komsilga. Similarly, health problems were cited as a major constraint by 100% of keepers in Koubri, 96% in Komsilga and Pabré, and 92% in Saaba. There was no significant variation in either of these constraints by commune ($p > 0.05$). To address health issues, 32% of keepers sought veterinary services, a proportion that varied significantly by commune ($p = 0.017$), being higher in Komsilga (48%) and Saaba (44%) than in Pabré (24%) and Koubri (12%).

Health problems were identified based on the keepers' own reports and observations, without clinical examination or veterinary confirmation. No

specific recall period was defined for reporting these health problems. Among the reported health problems, signs suggestive of parasitic conditions were mentioned by 48% of keepers, while skin-related, respiratory, and digestive problems were reported by 31%, 31%, and 19% of keepers, respectively.

Typology of donkey husbandry systems

Multiple Correspondence Analysis (MCA)

The Multiple Correspondence Analysis applied to the socio-economic characteristics and husbandry practices of donkey keepers identified two main dimensions of differentiation, jointly explaining 26.79% of the total inertia: 16.24% for axis 1 and 10.55% for axis 2 (Figure 2).

The first dimension reflects a differentiation of keeper profiles by commune, linked to donkey-husbandry experience, family status, and gender. Positive coordinates were associated with keepers from Saaba, characterized by a stronger representation of women, keepers aged between 12 and 40 years, beginners with 1–10 years of experience, and wives as donkey owners. Conversely, negative coordinates grouped keepers from Pabré, more strongly represented by men, heads of household as owners, and keepers with “intermediate” (11–30 years) or “high” (>30 years) experience. The second dimension was structured mainly by age, sex, main occupation, and use objectives. The positive side is dominated by keepers from Koubri and Saaba, men, keepers aged between 12 and 40 years (“young”), and heads of household, along with keepers whose main occupation is trade and those using donkeys primarily for transport. The negative side mainly groups keepers from Pabré and Komsilga, women, keepers aged between 41 and 60 years, spouses, and those whose main occupation is farming, along with the use of donkeys for both transport and field work.

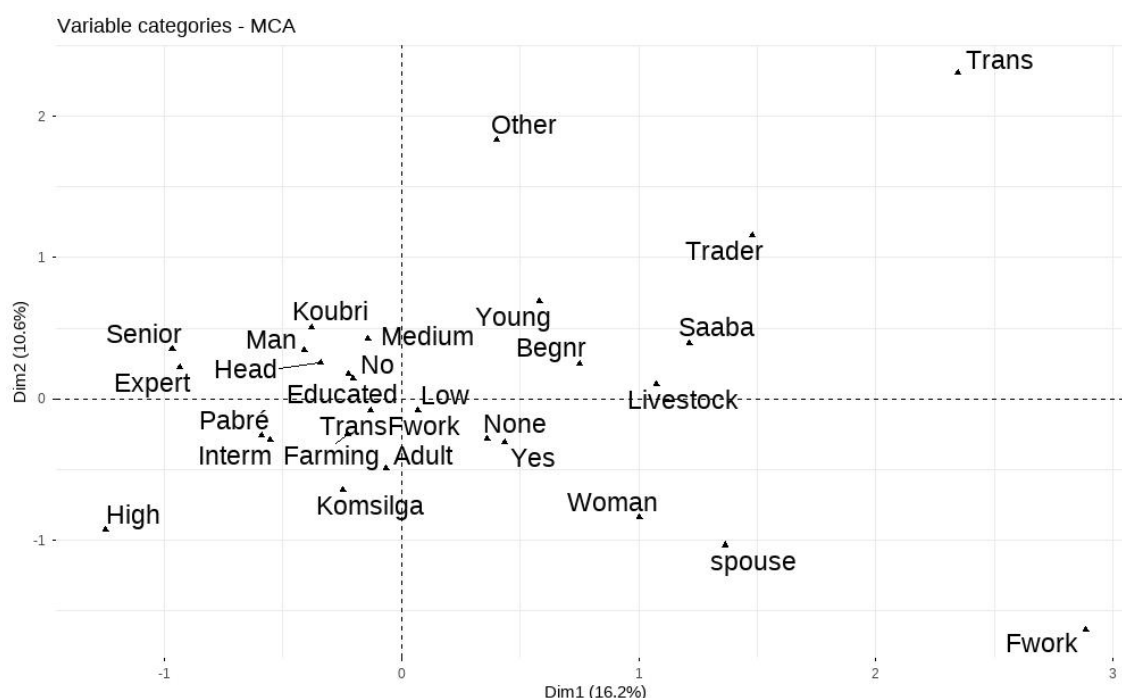


Figure 2: Multiple Correspondence Analysis (MCA) of donkey keepers' socio-economic characteristics and husbandry practices. The horizontal and vertical axes represent Dimensions 1 and 2, respectively. Axis 1 (Dim 1) explains 16.24% and axis 2 (Dim 2) 10.55% of the total inertia

Hierarchical Cluster Analysis

Hierarchical Cluster Analysis grouped keepers into three clusters. These clusters were characterized based on the categories most strongly and significantly associated with each group (Figure 3).

Cluster 1, comprising 41 keepers, was mainly composed of keepers from Pabré (60.98%). It also showed a high proportion of keepers with intermediate experience (85.37%), heads of household (97.56%), farmers (97.56%), literate keepers (80.49%), individuals aged between 41 and 60 years (70.73%), and men (85.37%). This cluster thus corresponds to a profile of predominantly male, head-of-household keepers aged 41–60 years, with intermediate experience and mainly engaged in farming, strongly represented in Pabré.

Cluster 2, comprising 28 keepers, was mainly represented by keepers from Koubri (82.14%). It also grouped keepers with more than 30 years of

experience (32.14%), individuals aged between 61 and 71 years (42.86%), heads of household (100%), and men (89.29%). This cluster corresponds to a profile of older, predominantly male, head-of-household keepers, characterized by extensive donkey-husbandry experience and mainly located in Koubri.

Cluster 3, comprising 31 keepers, was mainly composed of keepers from Saaba (70.97%). It also showed a high proportion of spouses as owners (61.29%), beginners with 1–10 years of experience (87.10%), women (64.52%), traders (29.03%), non-literate keepers (58.06%), and individuals aged between 12 and 40 years (48.39%). This cluster was also characterized by veterinary service use (51.61%) and by the transport objective (12.90%). It thus corresponds to a profile of relatively young, predominantly female, beginner, spousal keepers, more closely associated with trade and transport use, strongly represented in Saaba.

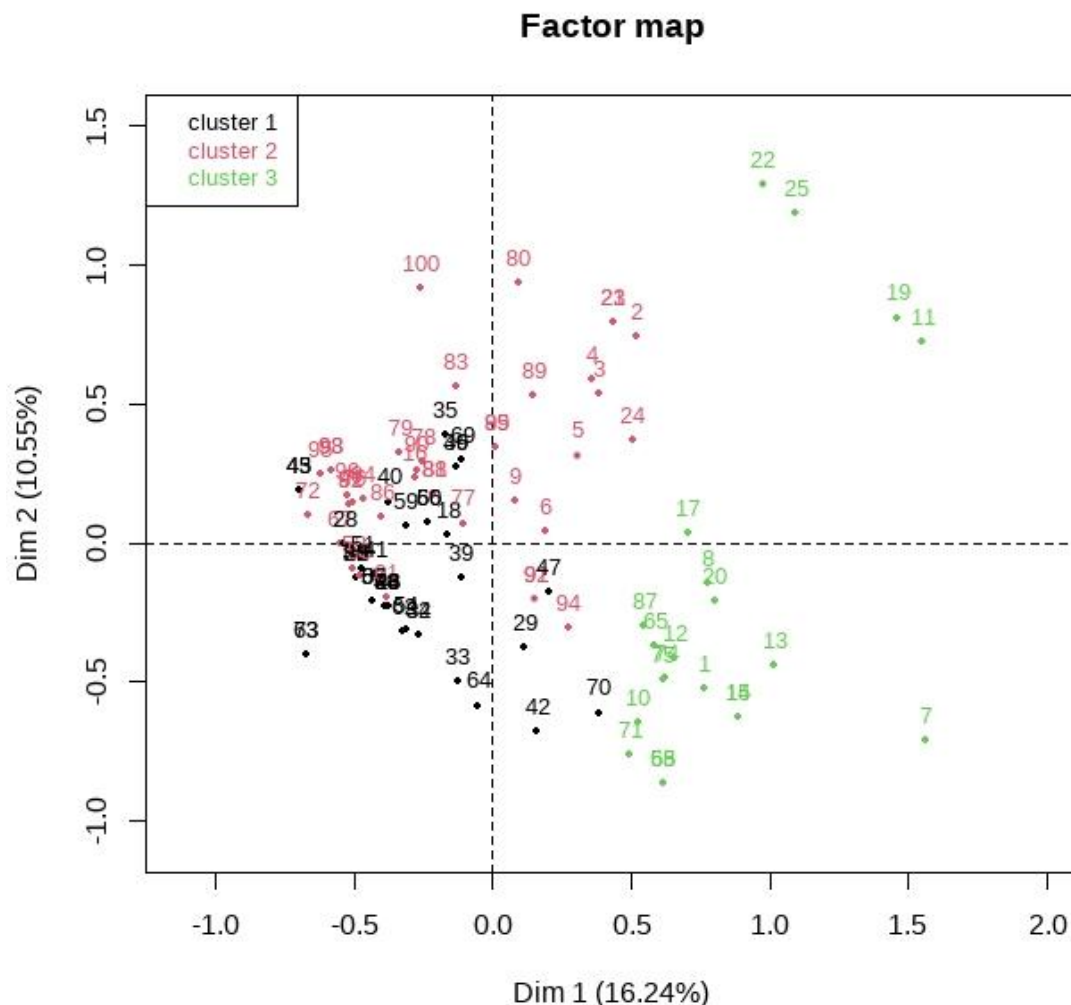


Figure 2: Hierarchical Classification Ascending of individuals into three clusters. Cluster 1 is shown in black, Cluster 2 in red, and Cluster 3 in green. The numbers correspond to the identification numbers of the individuals assigned to each cluster

DISCUSSION

The predominance of men among donkey keepers observed in this study is consistent with findings reported across several sub-Saharan African countries (Haile, 2023; Nguekeng et al., 2022; Koko and Shuiep, 2016). This pattern likely reflects the fact that, in many rural communities, owning, handling, and managing working animals is traditionally regarded as a male-dominated activity. Nonetheless, the involvement of women in donkey keeping points to their growing contribution to rural production systems. In Ghana, Maggs et al. (2021) found that women donkey owners regarded these

animals as an important component of their livelihoods, particularly through their use in income-generating activities.

The predominance of keepers aged between 41 and 60 years observed in this study indicates that donkey husbandry is mainly carried out by economically active individuals. This finding is consistent with reports from Hassan et al. (2022) in Southern African and Maggs (2022) in Ghana, who similarly documented a strong representation of the same age bracket among donkey owners. This is

likely because adults generally have greater experience and access to resources needed to manage animals and carry out the agricultural activities to which donkeys make an essential contribution. However, Maswana et al. (2022) found that most donkey owners in South Africa were over 60 years old, illustrating how socio-economic context and production systems shape ownership patterns differently across regions. In the present study, most keepers had a low level of education, mostly limited to primary school. Combined with the predominance of farmers among respondents, this finding is comparable to results reported in several other sub-Saharan African studies (Mwasame, 2020; Nguekeng et al., 2022), in which donkey husbandry is mainly associated with rural households practising family farming and using donkeys as working animals. Indeed, donkeys play an essential role on African family farms by facilitating ploughing and the transport of harvests, water, firewood, and agricultural inputs. Maggs (2022) showed that donkey ownership directly contributes to rural household livelihoods by improving transport capacity and reducing the burden of agricultural labour.

The keepers surveyed in this study mainly held small numbers of donkeys. In Burkina Faso, owning few donkeys is generally observed among farmers who use these animals primarily for agricultural work, especially draught power, and for transporting harvests, water, and firewood (Tapsoba, 2012). Owning a small herd therefore appears to reflect a strategy geared toward supporting agricultural activities and household needs, rather than a specialized breeding-oriented approach. The observed herd composition, in which most keepers owned only male animals, further supports this interpretation. The results of this study show that donkey husbandry is oriented primarily toward transport and field work. This predominance of work-related uses confirms the major socio-economic role of the donkey in family farms, where it serves above all to enhance rural households' capacity for work rather than as a source of animal production. The use of donkeys for transport and field work are consistently the most commonly reported uses across the literature (Tapsoba, 2012; Maggs et al., 2023; Asteraye et al., 2026). In our survey, donkeys were mainly used to transport water, firewood, harvests, agricultural

inputs, and goods intended for sale, as well as for draught power on family farms. Maggs et al. (2023) similarly emphasize that this utilitarian role in transport and traction substantially reduces the burden of agricultural work and improves rural livelihoods.

Regarding husbandry practices, donkeys in this study were kept exclusively under extensive systems, characterized by traditional shelters and a diet based mainly on natural pasture and locally available forage resources. This can be explained by the essentially utilitarian role of the animal, whose keeping is integrated into the farming system to provide low-cost working power. These findings align with Wassie et al. (2023), who showed that donkeys are predominantly kept under extensive or semi-extensive systems, grazing freely during the day with limited purpose-built shelter. Similarly, Masebo et al. (2025) note that extensive systems remain predominant in low-income countries owing to their low production costs and the availability of natural rangeland. Moreover, the absence of a breeding objective and, therefore, of deliberate donkey production in the herds surveyed may reflect the purely utilitarian role that keepers assign to the animal. The long gestation period of the donkey and its relatively low market value likely also discourage deliberate breeding. In any case, this raises questions about the long-term renewal of herds, and thus about the sustainability of the species in a context where mechanization is increasingly replacing animal-based working power.

Respondents reported knowing only a single donkey breed, distinguishing animals mainly by coat colour through vernacular naming. This suggests that, in the study area, donkey differentiation relies more on phenotypic traits than on any formal breed classification. Similar observations have been reported elsewhere in West Africa, where donkey populations are traditionally identified by coat colour and given local names such as Idabari (grey), Auraki (red/bay), Duni (black or dark brown), and Fari (white) (Khaleel et al., 2020; Bemji et al., 2026).

The results of the hierarchical clustering reveal three distinct profiles among donkey keepers, reflecting heterogeneity in husbandry systems within the study area. This diversity suggests that husbandry practices are shaped not only by the

characteristics of the species itself, but also by socioeconomic factors, keepers' level of experience, and local specificities. Studies conducted elsewhere in sub-Saharan Africa have

similarly shown that keeper characteristics strongly influence equid management practices, including reproduction control, animal care, and use on the farm (Swai and Bwanga, 2008; Maggs et al., 2023).

CONCLUSION

This study highlights the important role of donkeys in the rural farming systems of the study area. Donkey husbandry was primarily oriented toward utilitarian functions, particularly transport and field work, underscoring the contribution of donkeys to agricultural activities and household livelihoods. Donkey identification relied mainly on phenotypic characteristics, particularly coat colour, with the use of local names. However, the limited attention given to reproduction and the widespread absence of mating control indicate that donkey husbandry remains largely traditional, which may limit opportunities for systematic selection and genetic improvement of local donkey populations. The distinct keeper profiles identified in this study further suggest that husbandry practices are influenced by age, experience, socioeconomic context, and commune. Strengthening technical support and conservation efforts for local genetic resources could contribute to the sustainable development of donkey husbandry and better recognition and sustainable use of local donkey populations.

These findings should, however, be interpreted in light of the study limitations. The relatively small sample size and the non-probabilistic sampling approach may limit the representativeness and generalizability of the findings to the broader donkey-keeping population. In addition, some information, particularly regarding health problems, was based on keepers' reports rather than clinical examinations or veterinary diagnoses. Further research involving a larger sample of donkey keepers and wider geographic coverage is therefore recommended to validate and extend these findings. Such studies would contribute to a more comprehensive characterization of donkey husbandry systems and provide stronger evidence to support the sustainable management, conservation, and valorization of local donkey genetic resources.

Conflict of interest

The authors declare that they have no conflicts of interest.

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