

Donkey-Cart Transport, a Source of Livelihood for Farmers in the Kassena Nankana Municipality in Upper East Region of Ghana

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Abstract

Even though donkeys have been extensively used by people in many areas in the world, their use has been synonymous with backwardness, underdevelopment and low status. In a qualitative and quantitative study of 120 households located within the Kassena-Nankana district, this study sought to provide an overview of the consequences of 'development' for donkey use and management. The study also tried to show how the use of donkeys had enabled these people to withstand some of the threats to their lives and livelihoods. The paper provides several examples of how these different uses ensured the survival of women and men in hostile environments and enables them to integrate into the social and economic processes from which they are often excluded. Both primary and secondary data sources were used to gather relevant information for analysis and discussions. Purposive sampling was used to select four communities in the Kasena-Nankana East District. A hybrid sampling method was used to arrive at the sample population. Close and open ended questionnaire were used to collect data from the interviewees. In addition to the questionnaire, empirical verification was done via observation on attitudes and behaviors of farmers. Focused group discussions were held involving opinion leaders, farmer-group organizations, agric extension officers, and the 31st December Women's Movement (DWM) chiefs. Data obtained was analyzed using Statistical Package for Social Scientist (SPSS) and Microsoft Excel. The results of the study revealed that majority of the respondents were in 32- 50 year group. Most of the respondents, 93 (58 %) had no formal education. Majority (75.5 %, 124), were married with 47% (74) having household sizes between six and ten. The study revealed that, donkeys were used in agricultural production, mainly to transport manure to the fields and the harvest from the fields to the homes and to the market centres; the youth in agriculture production had realized the importance of donkey transportation and farm traction, which had a very significant impact on food security development.

Keywords: Attitude, Donkey-Cart, Farmers, Gender, Households, Livelihood, Transport

1. Introduction

Donkeys are considered as beasts of burden in many developing countries (Crossley, 1991; Svendsen, 1991). Investigations of the role of donkeys in rural areas have received increasing attention from researchers and those in development over the last decade (e.g. Fielding and Pearson, 1991; Bakkoury and Prentis, 1994; Starkey, 1998). Despite the above, there is little quantitative information on their role as pack animals in marketing produce. Observations have shown that, in many peri-urban areas in Africa, draught animals can provide an important means of transporting goods and produce (Teshahunegan, 1986).

A donkey or other pack animals provide a means of transporting a range of products more rapidly to markets and in greater amounts than can be done on foot, but cheaper and more easily than relying on public transport or motor vehicles. It increases the range of distances over which produce from a farm can be sold. It is a door to door service, so perishable products such as vegetables (especially tomatoes in Ethiopia), milk, eggs, poultry, grain and animal fodder can arrive safely with less damage, stress or effort, than if they had to be transferred from one means of transport to another and back again. Teshahunegan (1986) calculated that even with a single animal the potential cost reduction from substitution of pack for human carriage is of the order of 50%. Howe and Garba (1997), in a study of subsistence farmers in Kaffecho Zone in Ethiopia found that pack animals offered the only realistic way of obtaining returns from agriculture above mere subsistence. Ownership of an animal in this area could significantly reduce total transport costs and increase both the returns to the farmer; and the range of distances over which it was economic to trade. In marketing crop products, high value products such as seeds offered better returns than the food staples such as maize and sorghum (Howe and Garba, 1997).

Pack animal transport is an enterprise that can be, and often is, undertaken by disadvantaged or displaced people (Sisay and Tilahun, 1997). Use of animals in transport has the potential to provide contractors with a steady

income (Wilson, 1991; Gebreab, *et al.*, 1997, Sisay and Tilahun, 1997). Several studies have shown that farmers with a cart or pack animal can get a higher price for their goods than those without access to animal transport (see review by Anderson and Dennis, 1994). Use of animals to move goods can help women in their daily activities. Women in peri-urban and rural areas have a heavy work burden. For example, in Ghana and Tanzania, a study of the transport needs of poorer sectors of the populations (Harrison and Howe, 1989) produced the following findings: the transport activities of a rural household in Tanzania occupy 2600 h/annum and involve a load carrying effort of 100 tonne-kms. The figures for Ghana are 4800 h/annum and 200 tonne-km. Women, on foot affect most of this transport. Most trips are undertaken to meet agricultural requirements, including marketing, and essential domestic needs (Harrison and Howe, 1989). Donkeys provide one of the best and most acceptable ways of reducing this workload in many different situations (Barwell and Dawson, 1993; Bryson and Howe, 1993; Leyland, 1997).

The main objective of the study was to investigate into ownership of Donkey-Cart transportation and transport ownership by sex in the Kasena-Nankana Municipality.

The specific objectives of the study were

1. To assess Attitudes of people towards donkey-cart possession and policies in the Kasena-Nankana East Municipality
2. To analyze the general overview of Donkey-Cart transportation as sources of livelihood over the past decade in Kasena-Nankana East Municipality

1.1 Research Methodology

1.1.1 Study Area

The district (Kassena-Nankana) is in the Upper East Region of Ghana and shares boundaries, to the north with Kassena-Nankana West and Burkina Faso, to the east with Kassena-Nankana West and Bolgatanga districts, west with the Builsa district and South with West Mamprusi district in the Northern Region (Fig 1).

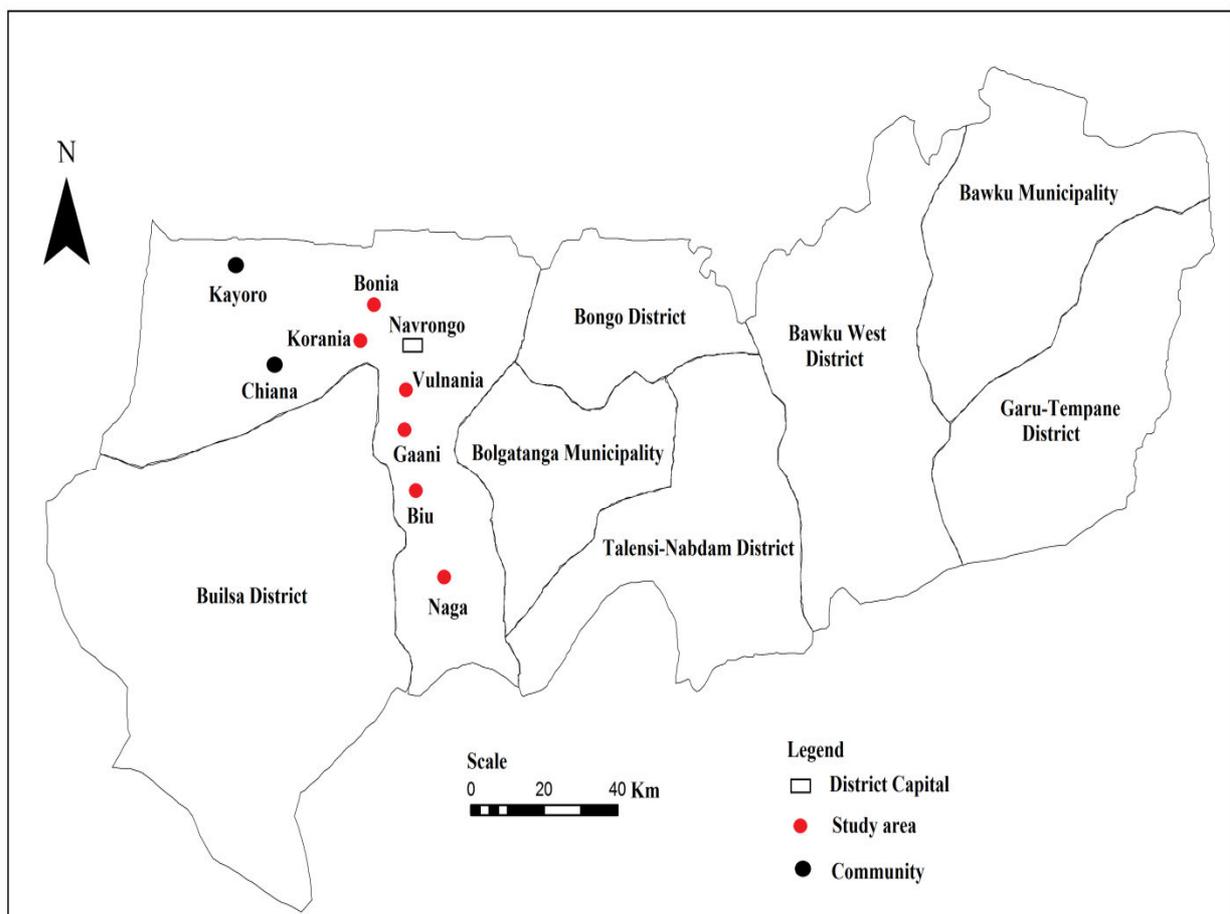


Fig 1: Map of Kasena-Nankani East Municipality Showing Study Communities in Red

The district recorded a population density of 91 persons per sq. km. This is higher than the national density of 79.7 persons per sq. km but below the regional density of 104.1 persons per sq. km. The climatic conditions of

the District are characterized by the dry and wet seasons, which are influenced mainly by two (2) air masses – The Harmattan air mass (North-East Trade winds) and the Tropical Maritime (South-West). The Harmattan air mass (North-East Trade Winds) is usually dry and dusty as it originates from the Sahara Desert. During such periods, rainfall is virtually absent due to low relative humidity, which rarely exceeds 20 per cent and low vapour pressure less than 10mb. Day temperatures are high recording 42° Celsius (especially February and March) and night temperatures are as low as 18° Celsius. The district experiences the tropical maritime air mass between May and October. This brings rainfall averaging 950mm per annum. This makes most of the youth in the district idle during the dry seasons (November to April). Two main types of soil are present within the District namely the Savannah ochrosols and groundwater laterite. The northern and eastern parts of the district are covered by the Savannah ochrosols, while the rest of the District has groundwater laterite. The Savannah ochrosols soil type is suitable for cultivation and hence accounts for the arable land sites including most parts of the Tono Irrigation Project sites where both wet and dry season farming activities are concentrated. The district consists of 216 communities – majority of which are rural, only 13 per cent of the population live in towns. At least three out of four people in the district reside in a rural area.

1.1.2 Data Collection

Both primary and secondary data sources were used to gather relevant information for analysis and discussions. Purposive sampling was used to select four communities in the Kasena-Nankana East District. Considering the nature of the communities in which the study was carried out, a hybrid sampling method was used to arrive at the sample population. Close and open ended questionnaire were used to collect data from the interviewees. In addition to the questionnaire, empirical verification was done via observation on attitudes and behaviors of farmers. Women and Men farmers of all ages were interviewed from the dry season farmers and livestock producers. Focused group discussions were held with various groups. It involved opinion leaders, farmer-group organizations, agric extension officers, the 31st December Women’s Movement (DWM) chiefs from the study areas etc.

1.1.3 Data Analysis

Data obtained was analyzed using Statistical Package for Social Scientist (SPSS) and Microsoft Excel.

2. Results and Discussion

2.1 Age of respondents

The age groups of the respondents are presented in Figure 1. The ages of respondents were grouped as 15-31 years, 32-50 years, 51-60 years and above 60 years. This was done to facilitate easy response and analysis.

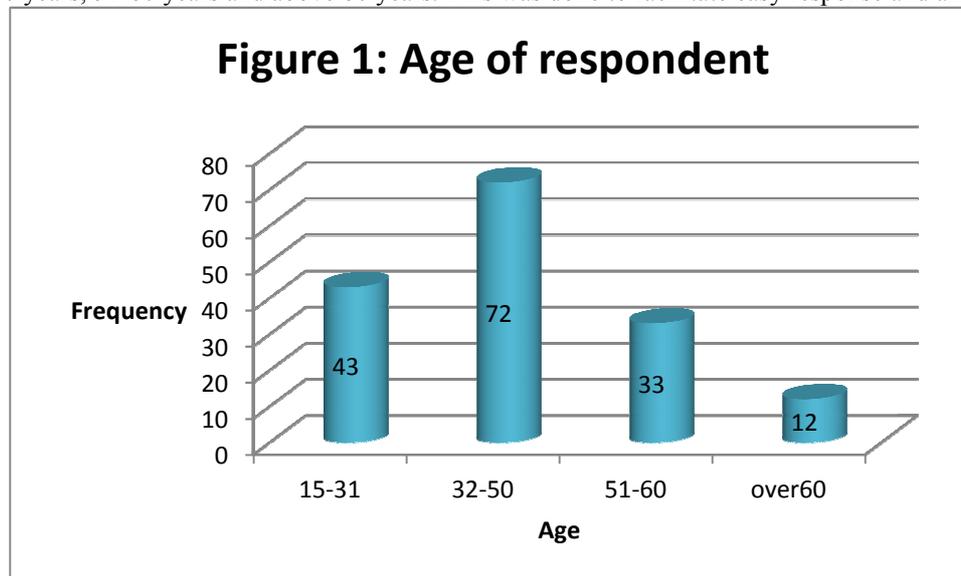
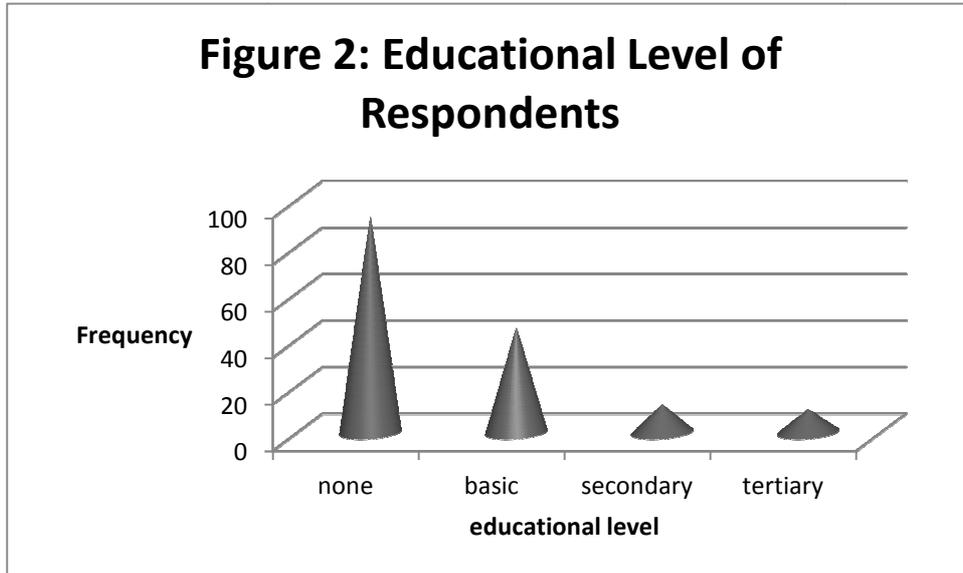


Figure 1 indicates that, the majority of the respondents are in 32- 50 year group. In African societies, age plays important role in decision making process, and the study area is not an exception. Those who were contacted are members of the communities who take part in decision making. These age categories are energetic and undertake most of the activities within the area of study.

2.2 Educational level

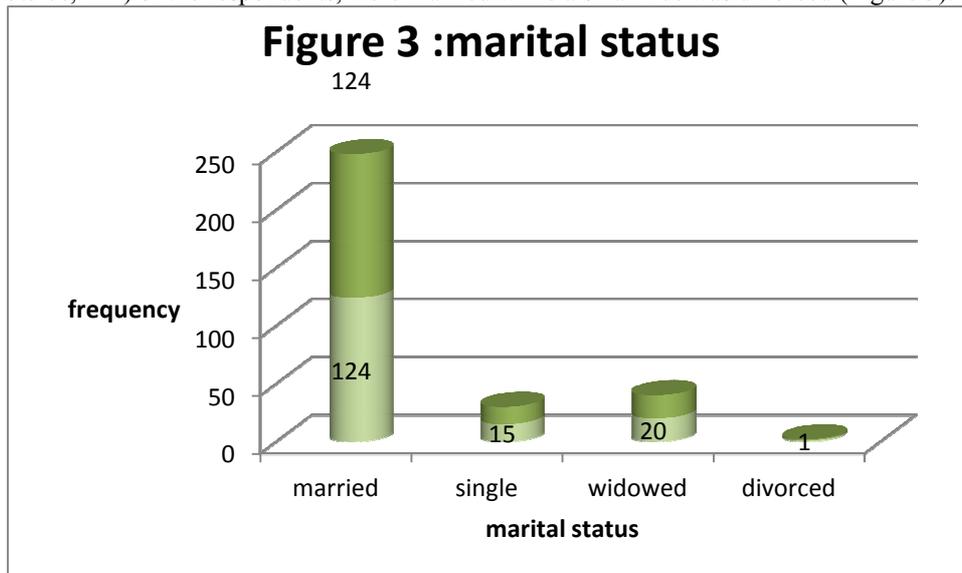
From Figure 2, most of the respondents, 93 (58 %) had no formal education with 28% having basic school education. Education has influence on perception and involvement, particularly in decision making and monitoring of activities regarding resource use. There is a correlation between the educational attainments of an

individual and how such individual imbibes different dissenting opinions (Carr, 1994). The low level of formal education in the area means little formal training. This adds pressure on the natural resource in the area.



2.3 Marital status of respondents

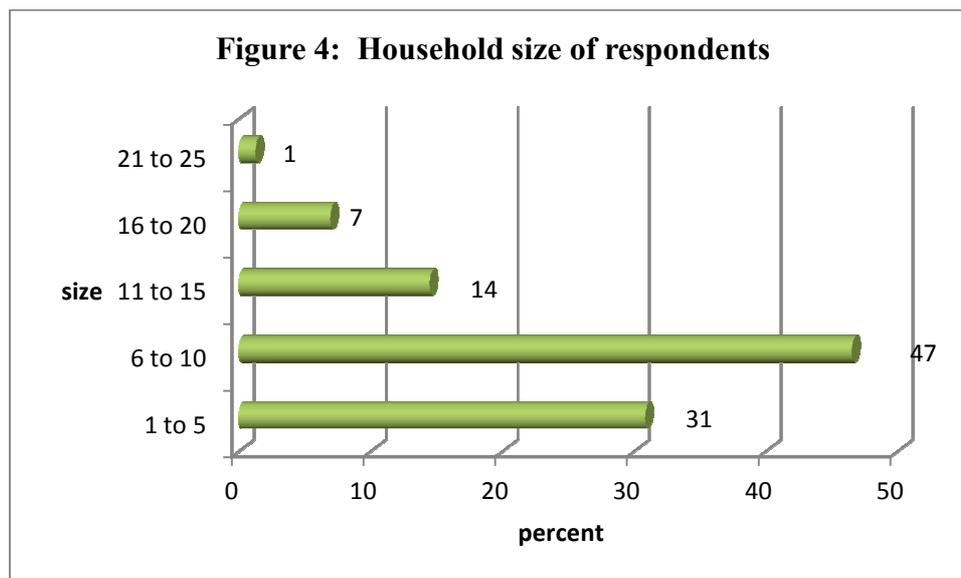
Majority (75.5 %, 124) of the respondents, were married while a small 1% was divorced (Figure 3).



Marital status determines the social standing as it also determines the involvement of persons in decision making processes. To a larger extent, it adds additional responsibilities which demand more land for farming since majority of the people in the study area were farmers.

2.4 Household size of respondents

Figure 4 shows that most respondents, 47%, 74 had household sizes between six and ten whereas 31% (49) had household size between one and five.



2.5 The general overview of Donkey-Cart transportation as sources of livelihood over the past decade in Kasena-Nankana East Municipality

A general overview of donkey-cart transportation, with participants, over the past ten to twenty years revealed that due to the introduction of the Tono irrigation project in the area (over the past thirty years) has come to supplement the rain fed agriculture to ensure food security in the communities which eventually culminated to farm power derived from donkeys, especially those farmers situated along the project site.

Over the period, dry season gardening for the production of vegetables, the cultivation of rice at the canals, fishing farming, rising of livestock among other crop production were some of the reasons for improved food security situation and the need for transportation of farm produce by these animals in the study area. Moreover, the study uncovered that, improvement of education of the people in terms of agriculture production, the introduction of improved technology and the availability of farm inputs was keen to this development over the period.

Finally, the youth in agriculture production had realized the importance of Donkey transportation and farm traction, which had a very significant impact on food security development and the transportation of farm produce in general during this period under review.

2.5.1 Gender and ownership of donkey-carts

The study showed that the type of transport system that majority of the people of Kassena-Nankana East district operate on were Donkey-cart transport system, bullock transport system and motor king transport system (Table 4.1). Respondents were asked to indicate whether they owned any form of transport system for carting farm produce and the type of transport system they operated on. About three-quarters (75%) of the people interviewed who indicated owning donkey-carts were men while women ownership of donkey-cart accounted for approximately 25% using for transport system and livelihoods in Kassena-Nankana East district. The 25% own by women were those left over by their late husbands or any male relative. Though ownership of donkeys by people of all sexes is common in many societies, in Kassena-Nankana East district, they are owned, used and controlled by men. The interview session confirmed that even women who owned donkey-cart cannot openly sell them without consulting a man. This is similar to studies by Mutharia, (1995) of several communities in Sahelian countries that the ownership of donkeys is almost entirely by men and that, among the Maasai for instance, though women had access to the use of donkeys, a woman could sell a donkey without a man's permission.

Table 4.1: Percentages of Ownership of Donkey-cart and type of transport system operate on by sex

Ownership of Donkey-cart						Type of transport system			Total
						Donkey-cart transport system	Bullock Transport System	Motor King Transport System	
Male	Own any form of transport system	Yes	58.4	8.3	0	66.7			
		No	0	0	8.3	8.3			
	Total		58.4	8.3	8.3	75			
Female	Own any form of transport system	Yes	25	0	0	25			
		No	0	0	0	0			
	Total		25	0	0	25			

However, the responses from the table 4.1 shows that though men owned donkeys, no male used donkey-cart or bullock-transport system for carting farm produce on farm by themselves. Only 8.3% of the males owned motor king that was used for carting farm produce. However, all 25% of the women who owned donkey-cart transport system used them for carting farm produce. No female owned bullock transport system or motor king transport system used for carting farm produce.

When owners of donkey carts were interviewed for the reasons for having or keeping donkeys in the district, they gave the following reasons for preferring donkeys to other animals;

- ✚ it is possible to plough with a single donkey than other animals;
- ✚ that donkeys worked faster than other animals and are easier to train;
- ✚ that donkeys are hardier than other animals, in that they tolerate drought better, are less susceptible to diseases and are in good condition at the end of the dry season and did not need supplementary feeding before they begin ploughing
- ✚ The low value of donkeys also makes them less susceptible to theft.
- ✚ that woman could use donkeys easily.
- ✚ access to donkeys is to show wealth. The low price of donkeys is in most part related to the fact that they are not perceived as multi-use animals. For instance donkeys are not usually considered in the payment of bride price and even donkey money is not used for dowry (else the wife will become a fool like the donkey).
- ✚ The lower cost of donkeys makes them more affordable to Kassena-Nankana East district people.
- ✚ Price is however, not the only determining factor for the increased use of donkeys in Kassena-Nankana East District.

At Kwarania, specifically, it was revealed that, women used donkey-cart transport system to support them carry their goods to market but their husbands or male children used them for ploughing and latter sell them for money.

Table 4.2 indicated that, 41.7% of respondents acquired the donkeys through individual effort and inheritance. Only 6.6% responded acquiring donkeys through restocking agent. Those who acquired donkeys through friends or relations were 11%. Nobody in the study area acquired donkeys through dowry.

Table: 4.2 Responses to how Donkeys are acquired for Transportation of Farm Produce

Source of acquisition	Percent
individual efforts	41.7
inheritance	41.7
restocking agent	6.6
Friends/ relations	11.0
Dowry	0.0
others	0.0
Total	100.0

2.5.2 Traditional knowledge and Myths about Donkey and its Uses

Almost all traditional users interviewed confirmed they had some knowledge about the utilisation and management of donkeys they possessed. The Kassena-Nankana East district people had a range of traditional equipment that they used with donkeys for fetching water, carrying household goods, carrying sick people to hospitals and many others.

Traditional communities also had certain beliefs relating to donkeys. Some indigenous people living in the community believed, for instance, those donkeys must be exchanged, not sold, because selling a donkey for money; especially women will bring misfortune to the seller. They also believed that to kill a donkey, it must not see the killer at the time of killing. Additionally, when killing a donkey, they covered its face with something to prevent it from seeing the killers or else its ghost will hunt all the killers. These Local sayings reflect local communities' attitudes towards donkeys. In Kwarania and other surroundings communities, they had the saying that 'donkeys reward you with a kick since it can talk'. Sometimes, the myths associated with donkeys prevent their use for other things such as dowry or as gift or a token of appreciation to people. For example, overworking a donkey in a field will make the donkey cry and if a donkey cries in a field the crop will fail. This and others made people to use them with care.

Table 4.3 revealed that about 75.8% of the respondents said yes to the item on using donkey-cart for transport system in their community, while 24.2% said no to the item. The most frequently used community of donkey cart for transport system was in Vunania, Kwarania and Gaani respectively.

The Bonia community was the least in terms of donkey-cart use as a means of transport for livelihood.

Table: 4.3 Responses to those who use donkey-cart as transport system by communities

	Using donkey-cart transport system for livelihood			Total
	Yes	No		
Community				
	Bonia	15.3	8.7	24.0
	Gaani	16.8	8.2	25.0
	Kwarania	20.9	4.1	25.0
	Vunania	21.8	3.2	25.0
	Total	75.8	24.2	100.0

2.5.3 Donkeys for transport

The use of donkeys for transport in Africa dates back to historic times (Fielding, 1988). This is in contrast to the situation in many African farming systems, where farmers have only recently started to use donkeys for cultivation because of changes in land-use patterns, agro-ecological conditions and labour availability. Packing is one of the most ancient forms of transport that preceded even the invention of the wheel; that it has survived to the present day emphasises its value (Fielding, 1988).

The use of donkeys as pack animals or for pulling a cart has enabled small-scale farmers to participate in the market economy of the municipality. Donkeys have reduced the domestic transport burden of rural women and have created employment and income-generating opportunities for many people. The Maasai community in Kenya uses donkeys for fetching water, for household shifting (during migration), for carrying the sick to hospital, for carrying sick calves, for transporting, shopping and for pulling fencing materials needed for constructing bomas (Mutharia, 1995). In Botswana, donkeys are used for transporting people and goods, for transporting sand for building houses and for fetching water and firewood (Aganga *et al*, 1994). In the more remote mountainous areas of Lesotho, donkeys are important for transporting grain to the mills (Moorosi, personal communication).

In Ethiopia, donkeys are a major mode of transport. They transport at least 12 different commodities including vital food supplies. During recent wars, donkeys kept guerrilla armies supplied with food, guns and ammunition. Some rural Ethiopians recall that in famines of the past they only survived by someone bringing in food on donkeys (Marshall and Zahra Ali, 2000). The role of donkeys in assisting refugees and guerrilla fighters is commemorated in northern Ethiopia. In Cairo and other Egyptian cities, Zabbalin communities use donkeys for rubbish collection (Salah Fahmy, 2000).

2.5.4 Socio-economic development issues of Donkeys

To measure the Socio-economic development issues of Donkeys transport system, respondents were asked to indicate the extent to which it was helpful to the people in the district and the owners. There is an association between education of people and their donkey cart transport system. The study concluded that the higher the education level, the better they performed (up to a certain point) in generating income through farming activities and other ventures. For example, people with educational background used modern technologies in farming

activities whereas those without used only traditional methods in farming. However, those with higher education turned to do only backyard garden farming. Some of the people in the study area ploughed up to 8 and above acres of land. A few of them said they were able to plant without using donkey draught animal.

During interview with indigenous people in the study area, it was asserted that the donkey meat is the most clean and tastiest one on earth. They added that it is the strongest animal and that is why they used them for carting. Donkey cart use in the district had helped a lot in socio-economic growth of the people and had helped to improved education levels, health care and social provision. But large numbers of people in the study area had not benefited from this animal power. It was later revealed that, the people of Kassena-Nankana East district were not aware of socio-economic development of donkeys. What has become increasingly obvious, as governments, multilateral and bilateral agencies pursue 'development' is that economic growth does not eliminate poverty but alert people to work had.

2.5.5 Attitudes of people towards donkey cart possession and policies

Despite the apparent advantages and importance of using donkeys to transport goods, recognised by the public who are direct beneficiaries of the service, government planners and officials in general tend to regard it as an inferior occupation and are not keen to support these activities, particularly in urban areas, unless they can be convinced of the economic importance. The perceived adverse effects on traffic congestion of donkeys entering and leaving towns, their nuisance value and large concentrations at market places, also hardens official attitudes against donkey use in the peri-urban fringes. In the future this is an issue that is unlikely to be confined to Navrongo but may spread to other parts of peri-urban Africa where road traffic is increasing, but donkeys are currently bringing goods into and out of towns, both by pack and cart.

Table 4.4 shows the raw counts of the responses to the liker scale on attitude towards donkey cart possession and policies.

Table: 4.4 Percentages of people responding to the various Items constituting attitude towards donkey cart possession and policies

Item	positive	negative
Routine maintenance on donkey cart	76.2	23.8
Veterinary services	63.1	36.9
Interest in training donkey cart	76.9	23.1
Hiring of donkey cart	55.6	44.4
Extension officers and veterinary officials	61.0	39.0
All	62.6	27.4

The results from table 4.4 shows that farmers had positive attitude towards donkey cart possession and policies. About 62.6% responded positively to all the attitudinal dimensions measured. While a total of 27.4% responded negatively to the items. The highest positive response was in 'Interest in donkey cart activities (76.9%)'. Again about 76.2% indicated a positive response to routine maintenance. The least positive response was in the dimension of hiring of donkey. The table shows that the people of Kassena-Nankana East district had positive attitude towards the use of donkey cart transport system and that had, to some greater extent, positive impact on the people.

2.5.6 Environmental issues

In some urban areas, donkeys are regarded as an environmental hazard. However, people of the study area opined donkey were environmentally friendly animals. Respondents indicated that when donkeys are housed well, they did not smell or pollute the environment with faeces. Rather the manure is collected and sold as fuel to low income families in the village. This is an extreme case. However, the problems of environmental pollution when large concentrations of animal congregate cannot be discounted. Increased use of donkeys in transport would add to this problem. On the positive side, collection of the manure for fuel reduces demand for firewood although increased availability of donkeys to transport firewood might be detrimental to forests.

2.5.7 Donkey health and welfare

The study revealed that donkeys were the healthiest animals; donkeys did not often fall sick like other animals. On the question of feeding of donkeys, some respondent said, small boys who dropped out of school were hired to guide the animals to the forest to feed (them with) grasses. Others put them at one place but looked for grasses and other food materials to feed them. Getting source of water was not a problem because of the availability of the Tono dam. Some fed their donkeys with salt and others did not. During the dry season, donkeys were fed with dry grasses and that still made them fit.

2.5.8 Donkey transport in agriculture production

The study result in the focused group discussion indicated that the impact of Donkey-cart transport system on the livelihood of the farmers in the Kassena-Nankana East district in agriculture production was above average. The people interviewed stated that donkeys were used in agricultural production, mainly to transport manure to the

fields and the harvest from the fields to the homes and to the market centres. These transport functions were becoming critical as land is more intensively cultivated and families begin to depend on income from marketing cash crops.

The study on the impact of donkeys-cart transport in Kassena-Nankana East district indicated that the use of donkey-carts was an essential component of the farming system. The Kassena-Nankana East district is a highly productive agricultural area and the agricultural systems practised by the farmers required a great deal of animal power for transport of farm produce.

Table 4.5 shows the raw counts of the percentage responses to the liker scale about Donkey transport in agriculture production.

Table: 4.5 Percentages of people responding to the various Items about Donkey transport in agriculture production

Items	Percent
sold in more distant markets	16.7
sold in local markets	58.3
things to market	91.7
Other services	25.0
Total	100.0

Most (91.7%) households in Kassena-Nankana East district depended on donkey carts for the transport of items to the market; farm produce and many others. Donkey carts were used by 58.3% of the households for marketing crops sold in local markets and over 16.7% of the households for the marketing of crops which were sold in more distant markets, while 25% of other services for Donkey cart transport system on the livelihood of the people of Kassena-Nankana East district in agriculture production were recorded.

During the dry seasons, farm animal food is scarce and the owners of livestock have to move from place to place to find it. In such periods, ownership of donkey cart transport enables the livestock farmer to move longer distances to carry the available food in reasonable amounts, all by means of donkey cart transportation.

3. Conclusion

Donkeys have not been considered a significant component of the development process. For many of the institution promoting 'development', the use donkeys have been considered an indicator of backwardness and underdevelopment Traditional attitudes to donkeys have also been quite negative and in some instances have inhibited the spread of donkey use. This attitude has led to a loss in the traditional knowledge relating to donkeys and to a lack of investment in the research and development of donkey issues. Field observations however indicate that this may be changing. In parts of Ghana, farmers observed that in periods of significant food insecurity, donkeys were more important than oxen. In one area, people are now even considering donkeys as appropriate for bride price (marshal *et al*, 1997).

Donkeys are owned and used by large numbers of people engaged in small scale agriculture, by small – scale transporters and, in some areas, by women. Ownership and access is made possible by the relatively low value of donkeys and by their perceived low status. Increasing recognition of the importance of donkeys (particularly their ability to withstand drought and their role in transport) is resulting in a spontaneous diffusion of donkeys to 'new' areas. In many communities, households without donkeys are able to access them through sharing and hiring arrangements.

Donkeys are used in a variety of activities. Smallholder farmers use donkeys to cultivate their land, coping with labour shortages and loss of other livestock due to drought. By using donkeys in agriculture and transport, farmers have increased their productive potential and expanded their marketing options. Donkeys have also provided employment for many people who hire out donkeys or use donkey carts on a commercial basis for a transport service.

The use of donkeys has enabled women to overcome the cultural barriers to the use of work animals and to mitigate some of the additional burdens that intensification of cultivation and shortages of labour have imposed on them. In most societies where donkeys are easily accessed by women they find it easier to work with them and have benefited from their use in farming, and in relieving women's domestic transport burden. The use of donkeys has also helped women make use of new income-generating opportunities and contributed towards changing gender power relations. Gender inequalities that restrict women's ability to make use of existing systems of trade to acquire donkeys, carts and equipment can be overcome by alternative credit arrangements.

The above discussion indicates that donkeys have been made 'invisible' by the formal institutions of

development. However, women and men marginalized by the development process are using donkeys as a resource to ensure their survival in a hostile environment. In some cases donkeys allow disadvantaged people to re-establish links with the social and economic processes from which they have been excluded.

The main objective of development must be the improvement of the lives and living standards of the people who comprise society. This must be the alternative to the model that puts economic growth and ‘modernization’ of nations as its goal. For development professionals subscribing to this alternative, the challenge is to recognize donkey use and management as an appropriate and affordable technology for farmers with minimal resources.

References

- Aganga, AA, Tsopito, CM & Seabo D. (1994). Donkey Power in Rural Transportation: A Botswana Case Study. *Appropriate Technology Journal* **21** (3): 32-33. Intermediate Technology Publications. London. UK.
- Bakkoury, M & Prentis, RA. (eds) (1994). *Working Equines*, Proceedings of the Second International Colloquium, April, 20-22. 1994, Rabat, Morocco, Actes Editions, Rabat.
- Bryceson, DF. (ed.). (1995). *Women Wielding the Hoe. Lessons from Rural Africa for Feminist Theory and Development Practice*. Oxford: Berg.
- Bryceson, DF & Howe, J. (1993). *Rural Household Transport in Africa: Reducing the Burden on Women?* Africa Studies Centre Working Papers, Vol 15, Leiden, The Netherlands.
- Crossley, P. (1991). Transport for Rural Development in Ethiopia. In: *Donkeys, Mules and Horses in Tropical Agricultural Development* (eds D. Fielding and RA. Pearson), pp 48-61, Centre for Tropical Veterinary Medicine and School of Agriculture, University of Edinburgh. Edinburgh, 20 pp. ISBN 0-907146-11-2.
- Fielding D, (1988). Pack Transport with Donkeys. *Appropriate Technology Journal* **15** (3) 11-13. Intermediate Technology Publications. London. UK.
- Gebreab Fesessa, Wold, A. G., Kelemu, F., Ebro, A. and Yilma, K., 1997. An overview of donkey utilization and management in Ethiopia. Paper given at the Animal Traction Network of Eastern and Southern Africa (ATNESA) Workshop “Improving donkey utilisation and management” 5-9 May 1997, Debre Zeit, Ethiopia. (in press).
- Mutharia L, 1995. Oloyiankalani Group Ranch: A participatory assessment of pastoral resources and their utilisation in selected areas of Kajiado District. Intermediate Technology Kenya. P.O.Box 39493. Nairobi.
- Pearson, R.A. and Ouassat, M. 2000. A guide to live weight estimation and body condition scoring of donkeys. Centre for Tropical Veterinary Medicine, University of
- Tesfahunegan, M. 1986. Rural transport systems in Ethiopia. In: *Towards a food and nutrition strategy for Ethiopia* pp 456-482, 8-12 December 1986, Alemaya University of Agriculture, Ethiopia.

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