
Survey on the Use and Management of Animal Traction Technology by Farmers in some selected Local Government Areas of Gombe State, Northeast Nigeria

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ABSTRACT

A study was conducted to examine the use and management of animal traction in Gombe State, Northeastern, Nigeria. The study was carried out in six out of the eleven Local Government Areas of Gombe State. Twenty five (25) farmers were randomly selected from each local government area, making a total of 150 farmers. Data were collected by use of structured questionnaires and information were generated on the types and breeds of animals used for traction, production systems employed, supplementary feeding of the draught animals, methods of land acquisition, size of farmlands under cultivation, years of animal traction experience, preference of animals among others. The results showed that most of the respondents used bulls (96.6%) for their farming operations and the most preferred breed was Bunaji (91.3%) and 76.0% of the respondents acquired their farmlands through inheritance. The result showed that subsistence farming was the most practiced farming system (34.0%) in the study area on land areas of 1-5 hectares (72.0%). Also, majority of the respondents provided supplementary feeding to their animals (68.6%) and have 6-10 years of traction experience (40.0%). Most of the farmers (83.3) preferred draught power to tractors due to their availability and affordability in the area. It is concluded that farmers in the study area preferred draught animal power to tractors for their farming operations.

Key words: use, management, animal traction technology

INTRODUCTION

The need to increase farm power in Nigerian agriculture to supplement and possibly replace human labour has long been recognized. NICA (2008) concluded that the only way for farmers in Nigeria and Africa as a continent to realize their production target is by going into mechanized farming. The use of tractorization and other farm implements yield greater productivity of farm produce. Babatunde (1996) reported that thousands of tractors were procured and recent investigations shows that over 50 percent of these

tractors have either broken down or are unserviceable due to various reasons including; lack of spares, poor operation and maintenance, and the unhealthy national macro-economic trend which has affected adversely tractor and equipment prices. It was reported by Ajav (2000) that the current high cost of ownership of farm tractors in Nigeria, militates against the use of tractors by majority of the farmers who are poor and live in rural areas. An alternative to this problem is to device an appropriate intermediate technology, which should be simple in construction, operation and maintenance. It

should also be affordable to majority of farmers for increase in food production in countries with scarce resources such as Nigeria. It has been noted that majority of farmers in sub-Saharan Africa, particularly Nigeria, practice small-scale mixed farming on land area of less than 4 hectares (Pearson, 1995). For these people, draught animals may offer a feasible alternative to manual labour in the cultivation of food and cash crops (Pearson and Vall, 1998). Animal traction was first introduced into Nigeria in 1922 by the colonial government to improve agricultural production, particularly the production of export crops like groundnut and cotton in northern Nigeria where there is a tradition of keeping large ruminant animals adaptable for draught purposes (Musa, 1990). Therefore, use of animal power may enable farmers in sub-Saharan Africa to increase agricultural production and improve the quality of lives. Animal power is an important output from large ruminants on many small-scale farms in Asia, sub-saharan Africa, and Latin America (Lawrence and Pearson, 2002). It is the use of cattle, donkey, camels and horses as a source of power for crop production and in the process of transportation, field cultivation, crop processing and other related on-farm and off-farm operations (Fashina, 1995). Animal traction has the advantage to rural families of being available, timely and affordable particularly in the semi-arid and arid zones of Nigeria (Omatayo, 2010), he continued by saying it is also

capable of providing employment and transport, and promoting food production and security, thereby leading to a higher income, better standard of living and the much needed improvement in the image of farming and that of the Nigerian farmer. In northern part of Nigeria however, animal traction is used for land tillage by a large number of farmers particularly in the semi-arid and arid zones (Omatayo 2010). The main source of farm power in northern Nigeria where Gombe State is located is animal traction, since tractors are out of reach of an average farmer and manual labour is associated with drudgery and time consuming. Bako and Ingawa (1988) reported that in Kashere, a small village of Pindiga district of Akko local government area of Gombe state, most households have at least one pair of work oxen and many have up to four pairs. This indicated that animal power is extensively used in the area. Despite the fact that animal traction is widely used in the area, hoe farming is still very popular because of high price and inadequate number of tractors in the study area couples with the small size of farm lands, hence the need to promote animal traction which is cheaper and easier to maintain than tractors. The main objective of the study is to determine the use of animal traction in Gombe State, while the specific objectives are to determine the types and breeds of animals used and the management system practice in the study area with a view to improving the practice.

MATERIALS AND METHODS

The study was carried out in six out of eleven Local government areas of Gombe state. Two local governments were randomly selected from each of the three agricultural zones of the state. These are Kwami and Funakaye from Gombe North, Akko and Yamaltu-Deba from Gombe Central, and Billiri and Kaltungo from Gombe South. Gombe State is located between latitudes $9^{\circ}30'$ and $12^{\circ}30'$ North and Longitudes $8^{\circ}45'$ and $11^{\circ}45'$ East. The vegetation of the state is generally guinea savannah grassland with concentration of woodlands in the southeast and southwest. Gombe state is generally warm with average maximum temperature during the hot season, not exceeding 30°C . There are two distinct seasons: the dry season (November to March) and wet season (April to October). Average annual rainfall is 850mm. The state is endowed with rich agricultural land,

and about 80% of the people are mainly peasant farmers involved in farming food and cash crops, such as millet, sorghum, maize, vegetable, cotton and groundnut, through rain-fed as well as irrigation agriculture (Gombe SEED, 2006). Data on thirty three items was collected by means of structured questionnaires administered by personal interviews on one hundred and fifty farmers (25 per local government area) who used animals as sources of farm power. Information collected included personal data of the farmers, species/breed of animals used for draught, management and production systems employed size of farm land, as well as health aspect of the draught animals among others were analyzed by the use of tabulation, frequencies, percentages and pie charts.

RESULTS AND DISCUSSION

Table 1: Table showing age distribution of the respondents in the study area

Age range (years)	No. of respondents	Percentage (%)
21-30	26	17.3
31-40	66	44.0
41-50	37	24.6
51-60	17	11.3
60+	4	2.6
Total	150	100

From table 1, the study showed that all aged groups were involved in animal traction. However, majority of the respondents (44.0%) were within the age group of 31-40years. Abubakar, M., Kalla, D.J.U., Ngele, M.B. (2006) reported a similar age distribution among farmers in Bauchi State which shares borders with the study area. The relative majority younger age group

implies that the farmers can accept modern ideas to improve the productivity of their animals because younger minds are susceptible to changes. Sixty years and above accounted for only 2.6% of the respondents. This age group cannot withstand the rigorous routine stress of using the draught animals due to old age.

Table 2: A table showing methods of Land Acquisition of the respondents in the study area

Land acquisition	No. of respondents	Percentage (%)
Inheritance	114	76.0
Others	36	24.0
Total	150	100

As showed in table 2 above, land acquisition was mainly by inheritance (76.0%). This result is also similar to the findings of Abubakar *et al.* (2006). The similarity could be as a result of proximity of the two

neighboring states. Hence, the similarity in cultures and traditions that allows the inheritance of land and other valuables from parents to their offspring.

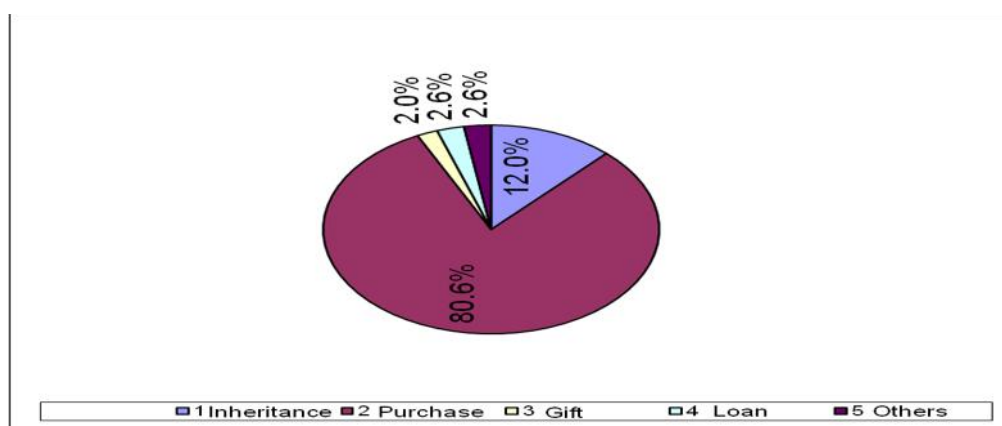


Figure 1: A pie chart showing method of acquiring draught animals in the study area

From figure 1, majority (80.6%) of the respondents purchased their draught animals, while few (12%) of them inherited them from their parents. The implication of this finding is that, even if the farmer inherited the farmland, it will be difficult to get the draught animals without having other sources of income. Some of the factors governing their choice when buying

draught animals included: Breed strength, health condition, docility and body conformation of the animal. Some (47.3%) of the respondents bought their draught animals at the age of 3 years while few (8.6%) of them bought them at one year. The implication of this is that the farmers will not have the advantage of raising and molding the behavior of the animal to their desire.

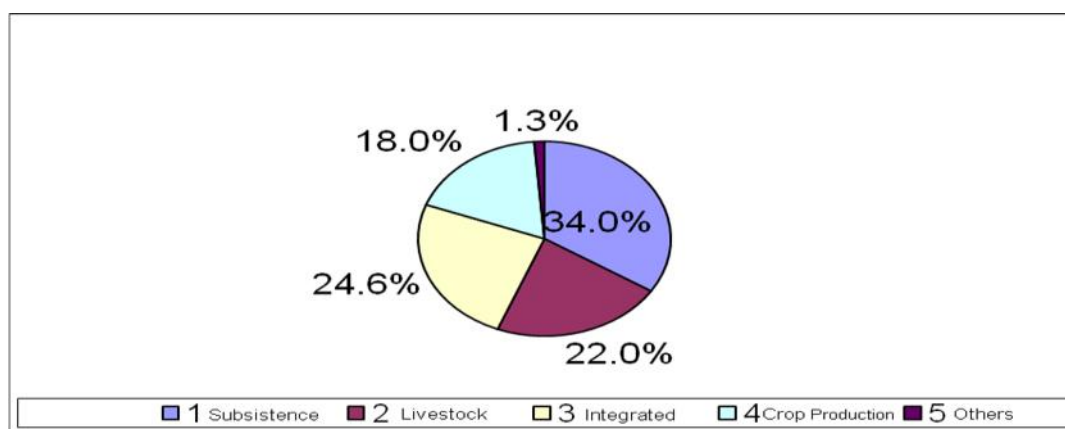


Figure 2: Pie chart showing type of farming practice of the respondents in the study area

It can be seen from figure 2, that subsistence farming is the most commonly practiced system of farming in the study area (34.0%) which confirms to the earlier report of Pearson and Vall (1998), that majority of farmers in sub-Saharan Africa practiced small scale farming on land area of less than 4 hectares. Umogbai (2011) also reported that farming in Northern Nigeria is

largely practiced by small scale farmers where about 86% still use hand hoe. Other respondents (24.6%) practiced integrated system of farming where both crops and animals are raised. While 22.0% and 18.0% respectively practiced livestock farming and crop production respectively as separate enterprise.

Table 3: Type and Breeds of animals Used for traction by the population in the study area

Parameter	No. of respondents	Percentage (%)
Bulls	145	96.6
Camels	5	3.3
Cattle and Camels	0	0
Total	150	100
White Fulani/bunaji	137	91.3
Gudali	7	4.6
Rahaji	1	0.6
Others	5	3.3
Total	150	100

Table 3 above, showed the type and breed of animal used for traction. Almost all the respondents (96.6%) used bulls in the study area, this result is similar to the findings of (Umogba, 2011) who reported that oxen in Nigeria and most of the West African countries are the common animals used for pulling tillage and other soil cultivation implements such as ploughs and ridgers, while donkeys are used to transport agricultural products. Few of the respondents, 3.3% used camels for farming operations. The reason

for that preference may be that the bulls are stronger and serve for reproduction as well as source of power and probably because camel is less numerous in the study area. A greater percentage of the respondents (91.3%) used Bunaji breed, which is in line with the findings of Ehoche (1996) who reported that in North Central Nigeria, Bunaji are most often preferred because of their docility. The preference of the Bunaji could also be due to the availability and adaptability of the breeds in the area.

Table 4: Table showing supplementary feeding of the draught animals in the study area

Parameter	No. of respondents	Percentage (%)
Yes	103	68.6
No	47	31.3
Total	150	100

It can be seen from table 4, that a good number of the respondents (68.6%) provided supplementary feeding to their animals such as salt lick, potash and groundnut cake, crop residues, hay, bran, dried leftover food and grains. The present result agreed with the earlier findings of Henriksson and Lindholm (2000) that some farmers use cassava and sugarcane as feed for

the animals, the leaves and pods of *Leucaena*, a leguminous shrub, are used as protein-rich fodder and concentrates for the supply of vitamins, minerals and fat for their draught animals. The farmers pointed out that animal that received supplementary feeding are healthier and perform better than those that do not receive any.

Table 5: Table showing methods of treatment of the draught animals of the respondents when they are sick

Parameter	No. of respondents	Percentage (%)
Use of veterinary clinic	105	70.0
Traditional method	4	2.6
Purchase drugs from open market	11	7.3
All of the above	30	20.0
Total	150	100

Table 5, showed the method of treatment of animals when they are sick. Health of the animals is very important in carrying out traction activity. A good number of the respondents (70.0%) use veterinary clinic for treatment of their animals when they are sick.

Others (2.6%) use traditional method while 7.3% purchased drugs from open market to treat their animals. Henriksson and Lindholm (2000) reported that health of animals is important if the work output is to be maintained. He continued by saying sub-clinical diseases are more difficult to cope with than the acute diseases,

since they may not kill the animal but severely reduce its productivity. Some of the common diseases affecting draught animals in the study area include helminthiasis, diarrhoea, pneumonia, septicemia, tuberculosis, foot and

mouth disease, contagious bovine pleura pneumonia, malnutrition, bloat, upper respiratory tract infection and tick infestations.

Table 6: A table showing preference for Animals to Tractors for Farming practice by the respondents

Parameter	No. of respondents	Percentage (%)
Yes	125	83.3
No	25	16.6
Total	150	100

Table 6, showed the respondents preference for animals to tractors for farming practice. Majority (83.3%) of respondents prefer draught power to tractors for their farming operations in the study area. The respondents preferred animal power because tractor use as of now has considerable limitations at the subsistence level and such limitations are the economics of tractor use and its spares for repairs are hard to come by (Umogbai, 2011) this finding agree with the earlier report of Ramaswam (1994) who stated that over 60% of farmers in developing countries depend on draught animal power for small-scale agricultural operations and rural transportation. The reason being that animal traction is cheaper compared to tractors. This confirms the earlier observation of Henriksson and

Lindholm (2000) who reported that the use of tractors is not economical for most farmers in the developing countries because of the subsistence nature of the production. The respondents' points out those tractors are usually unavailable at the right time which delays farming practice and draught animals are easy to maintain than tractors.

It was found that those with 6-10 years traction experience are the majority (40.0%) among the respondents in the study area. This implies that farmers are continuously attracted to the traction technology which might be as a result of the less cost involved and the subsidy packages and loan facilities offered by the government for purchase of animals and implements (Gombe SEED, 2006).

Table 7: Table showing the approximate size of farm under cultivation of the respondents

Parameter	No. of respondents	Percentage (%)
1-5 hectares	108	72.0
5-10 hectares	32	21.3
10 hectares and above	10	6.6
Total	150	100

Most of the respondents (72.2%) have farmlands of approximately 1-5 hectares for cultivation. This is in line with previous finding by Pearson and Vall (1998) that majority of farmers in sub-Saharan Africa practice small scale farming on land areas of less than 4 hectares. Bamidura and Gbadeyan (2011) stated that the farmers only produce for their families and quantity of food produced are grossly inadequate for the growing population. Therefore, is uneconomical for this people to practice mechanize farming as reported by Umogbai, (2011) that the use of motorized equipment and machinery is not advantageous when the size of the farm is small and the layout of the fields is irregular and where there is abundance of underemployed labour as obtains in Nigeria

CONCLUSION

It can be concluded that animals were extensively used in the study area and majority (83.3%) of the respondents preferred draught animals to

tractors for their various farming operations due to the small size of the farmlands 1-5 hectares (72.2%) which make the use of tractors uneconomical and unavailability at the right time in the study area. The study also revealed that most of the animals used for traction in the study area were bulls (96.6%) and Bunaji (91.3%) was the preferred breed. Majority of the respondents (68.6%) provided supplementary feeding to their draught animals and used veterinary clinics as methods of treating their animals when they are sick (70.0%).

REFERENCES

- Abubakar, M., Kalla, D.J.U., Ngele, M.B. (2006). Characteristics, Management and Use of Draught Animals in Bauchi State, Northeast, Nigeria. *International Journal of Natural and Applied Sciences*, **2**(1): 40- 46.
- Ehoche, O.W (1996). Report on Large and Small Ruminant Programme Presented at the Inaugural Review and Planning Workshop on Nationally Co-ordinated Research Programmes in Livestock. 13-15, NAPRI Ahmadu Bello University, Zaria, Nigeria.

- Pearson, A. R. (1995). Feeding Draught Animals for Work. **Feed mix**, 2: 13-17.
- Pearson, A.R. and Vall, E. (1998). Performance and Management of Draught Animals in Agriculture in Sub-Saharan Africa; A review. *Tropical Animal Health and Production*, **30** (5):309-324.
- Vall, E. (1996). Capacities de travail, comportement a l'effort et reponses physiologiques du zebu, de l'ane et du cheval au Nord-Cameroun. These de Doctorat, ENSAM, Montpellier.
- Bamiduro, J. A., and Gbadeyan, R. A . (2011). Small Scale Farming and Agricultural Products Marketing for Sustainable Poverty Alleviation in Nigeria. **7(3)**
- Lawrence, P.R and Pearson, R.A (2002). Use of draught animals' power on small mixed farms in Asia. *Agricultural Systems*, **71**:99-110
- Babatunde, O.O. (1996). An Appraisal of the Problem of Wheeled tractors used in Nigerian Agriculture. *Agricultural Mechanization in Asia, Africa and Latin America*, **27**(3), pp 23-26.
- Ramaswamy, N.S. (1994). Draught Animals and Welfare. *Rev. sci. tech. Off. int. Epiz.*, **13** (1), 195-216
- Omotayo, A. M. (2010). The Nigerian Farmer and the Elusive Crown. 30th Inaugural Lecture of the University of Agriculture, Abeokuta, Nigeria.
- NICA (2008). Tractor Hiring and Leasing. NICA Global Resources. <http://www.nicanig.org>.
- Umogbai, V. I. (2011). Development of Double-Neck Yoke and Harness for AnimalTraction. *Journal of Emerging Trends in Engineering and Applied Sciences* (JETEAS) 2 (1): 87-95
- Henriksson M and Lindholm E (2000). The use and Role of Animal Draught Power in Cuban Agriculture: a Field Study in Havana Province. *Minor Field Studies 100*. Swedish University of Agricultural Sciences, Uppsala, Sweden. 46p. ISSN 1402-3237.
- Gombe State Economic Empowerment and Development Strategy (SEEDS), (2006). Budget and Planning Bureau, ministry of finance and economic development, Gombe. Dandafid Nig. Ltd Iagos, Nigeria.
- Musa, H.L. (1990). Development and Use of Animal Drawn Implements in Nigeria. Proceedings of the First National Workshop on Draught Animal Power Research and Development in Nigeria. ABU, Zaria, Nigeria.
- Ajav, E.A. (2000). Animal Traction as a Source of Power for Agricultural Development in Nigeria. Proceedings of the Workshop of the Animal Traction Network for Eastern and Southern Africa (ATNESA) held 20-24 September 1999, Mpumalanga, South Africa.
- Fashina, A.B. (1995). Utilization of Draught Animals and Mechanisms of Drawn Implements: Ploughs, Harrows and Groundnut Lifters. Paper Presented at the National Animal Traction Workshop Held at NAERLS and Animal Traction Centre Maigana, Kaduna State, Nigeria. 20-24 March.