

EFFECTS OF THE USE OF DRAFT ANIMALS BY RURAL FARMERS IN JIGAWA STATE, NIGERIA

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Abstract

The study assessed the perceived economic utilization of draft animals by rural farmers in Jigawa State, Nigeria. A 3-stage sampling technique was used to elicit information from 160 respondents with the aid of questionnaire and structured interview schedule. Both descriptive and inferential statistics were used to describe and analyze the data. Findings revealed that the mean age of the respondents was 42 years, 99.4% were males and 92.6% were married. A majority of the respondents had no formal education. The mean household size of the respondents was four and the mean farm size was 13.6 hectares. (About (94.4%) of the respondents had no contact with extension agent. The mean farming experience of the respondents was 11 years. Most of the respondents purchased the draft animals used on the farm.. The most economic utilization of draft animals includes: drawing traditional plough (mean= 3.99), harnessing animals (mean= 3.86) and for the conveyance of material to and fro the farm site (mean=3.69). The major information gap was in the area of withdrawal time for drug usage prior to consumption (mean=3.99) and optimum usage of draft animals (mean=3.98). Also, the most serious constraints to the usage of draft animals include lack of capital and current information on the animal (mean= 3.698). Results of Chi-square analysis showed a positive and significant relationship between farming experience, household size, farm size and education ($p \leq 0.05$). The study concluded that the farmers derived several values from the usage of draft animals. It is recommended that the capacity of farmers should be strengthened in the areas of drug usage and application and extension services delivery to enhance optimal usage of draft animals

Keywords: Economic utilization, Draft Animals, Knowledge, Optimization

Introduction

Livestock animals such as cattle, horse, chicken, turkey, pig, sheep etc. have been a huge part of human existence since the beginning of civilization where human have used animals for meat, milk, labor, and clothing for thousands of years and millions of people around the globe take care of animals every day (Greg, 2014). According to Wikipedia (2017), livestock are animal raised domestically by man in an

agricultural setting to produce items such as food, fiber, and labor. They are ruminants (green leave feeders) that are kept purposely for food security and social insurance during the period of scarcity of resources and also mainly contributing to the power source for agricultural purposes (Source, year). The term animal traction and draft animal power are used interchangeably to refer to the domestic and partly domestic animals for the purpose of

tillage, transportation and others (Thornton and Gerber, 2010). Animal traction is an important reason for keeping livestock, particularly in poor rural societies in Africa, given that it is a cost effective 'labor-saving' technology for small scale and poor subsistence farmers compared to other forms of mechanization and the use of human power (Walter, 2015). Draft cattle are mostly found in a mixed farming system especially within the arid and semi-arid tropics and subtropics' where crop-livestock interactions are common (Mcintire *et. al.*, 1987). Ruminants graze pastures and can eat hay, silage, and high fibre crop residues that are unsuitable for human consumption (Mark *et al.*, 2014). This characteristic favors their domestication.

Draft animals power (DAP) is of fundamental importance in developing countries' agricultural production with a quarter of the total energy requirement emanating from this source. Draft animals assist in eliminating poverty; reducing drudgery and creating wealth. Animal traction is particularly important for food security in smallholder farming systems. They can assist directly with crop production through ploughing, planting and weeding and indirectly in the distribution, and rural trade. The draft animals save household (women and children) time and efforts in carrying water and fuel wood. They are also used for water-lifting, milling, logging and land excavation and road construction. Particularly Cattle (Oxen, Bulls and cows), Buffaloes, Horses, Mules, Donkeys and Camels (Tracy, 2009) are used for the listed activities.

Objective of the study

The general objective of the study is to assess the perceived economic utilization of draft animals to rural farmers in Jigawa State, Nigeria. The specific objectives are to:

- i. describe the socio-economic characteristics of the farmers;
- ii. identify the economic usage of draft animals to the farmers;

- iii. examine the farmers information gap on the usage of draft animals; and
- iv. identify the constraints militating against the usage of draft animals among farmers in the study area.

Hypothesis

H₀₁: There is no significant relationship between selected socio-economic characteristics of the farmers and perceived usage of draft animals.

Methodology

The study was conducted in Jigawa State Nigeria. Jigawa State is one of thirty- six states that constitute the Federal Republic of Nigeria. It is situated in the North-western part of the country between latitudes 11.00°N and 13.00°N and longitudes 8.00°E and 10.15°E. It has a total land mass of approximately 22,410 square kilometers with a population of 4,348,649 people (National Population Commission, 2006) while the estimated population in 2014 was 5,372,754. It is bordered on the West by Kano State, on the East by Bauchi State and Yobe State and on the North by Katsina State and Republic of Niger. The people are predominately Hausa/Fulani and their major occupation is farming.

A three-stage sample technique was employed for the study. Firstly, four local government Areas (LGAs) were randomly selected from each of the State Agricultural Development Programme zones. Secondly, four communities were randomly selected from each LGA. At third stage, ten farmers involved in using draft animals were purposively selected from each of the communities, thus, a sample size of 160 respondents were used for the study. Data collected were described using frequency counts, percentages, mean, standard deviation, while Chi-square statistics was used to test the hypothesis

Results and Discussion

Socioeconomic characteristics of the respondents

Results in Figure 1 showed that the mean age of the respondents was 42 years with a majority (80.0%) within the age of 41-50 years. It shows that the respondents are within their active and productive years. The implication is that most of

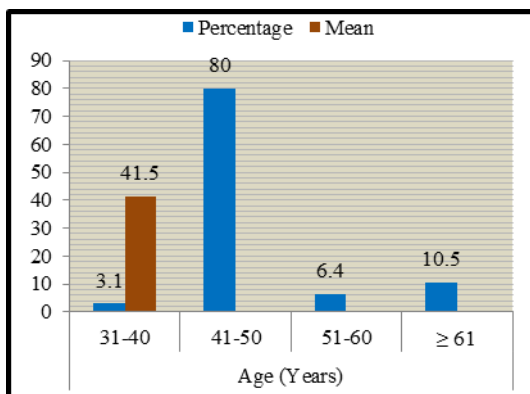


Fig. 1: Age of the respondents
Source: Field survey, 2017

The results in Figure 3 revealed that a majority of the respondents had no formal education (86.9%), 6.9% had primary education while 3.8% and 2.4% of the respondents had secondary and tertiary education respectively. It shows as high level of illiteracy of the respondents. Figure 4 showed that a majority (82.5%) of the respondents had a household size of 6-10 persons while the mean household size was 4.01 persons. The size of household can be a key variable in determining whether the respondents should participate more in various farming activities. A large household size

the farmers engaged in the use of draft animals are still young and are expected to make maximum use of the animals for economic gains. Figure 2 revealed a large and significant proportion (99.4%) were males with only 0.6% were females. The findings showed that most of the rural farmers were married (92.6%).

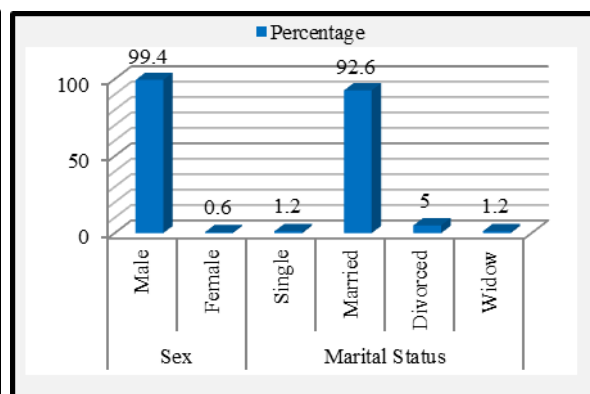


Fig. 2: Distribution of respondents by sex and marital

could serve as source of labour for farming activities. The mean farm size was 13.6 hectares. This indicates that majority of the respondents were relatively small-scale farmers who produce at a subsistence level. Most of the respondents (61.3%) have 1-10 years of farming experiences. The mean farming experience was 10.10 years. This implies that most of the respondents have been farming for quite a long period of time. Rural farmers with many years of farming experience are more likely to identify a suitable breed of animal for farming activities.

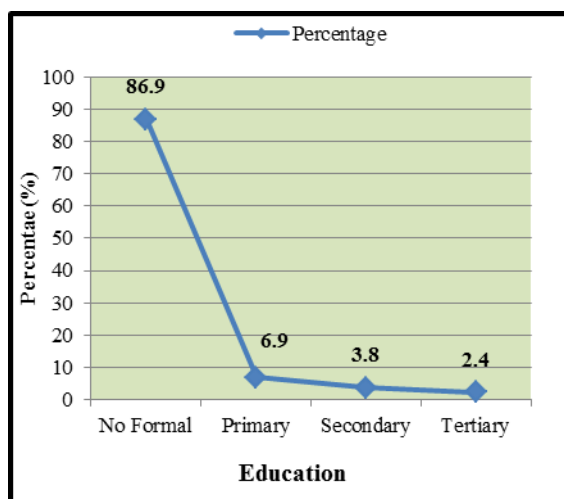


Fig. 3: Educational level of respondents

Source: Field survey, 2017

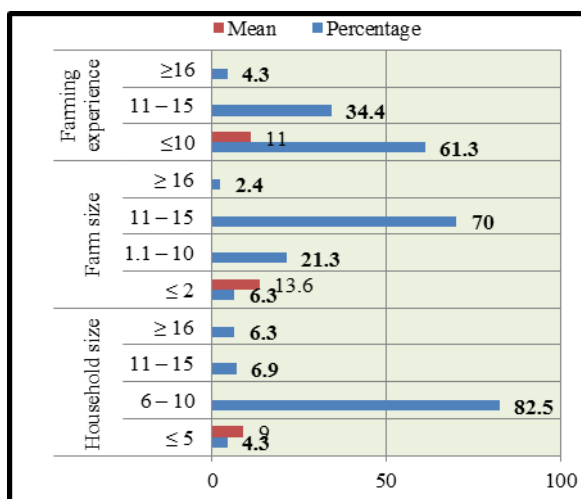


Fig. 4: Distribution of respondents by household size, farm size and farming experience

With regard to contact with extension, about (94.4%) of the respondents had no contact with extension agent. This implies that the impact of extension service has not yet been felt by the majority of the farmers and their associates in the study area (Fig.5). This also may be attributed to low ratio of extension personnel in the study area or out-right negligence by

extension agents. This implies that agricultural extension services did not have enough coverage in the study area, thus information spread through this means cannot readily be available to the respondents. Major source of draft animal were purchased. (70.4%) while 23.1% were gotten through contract rearing (Fig. 6).

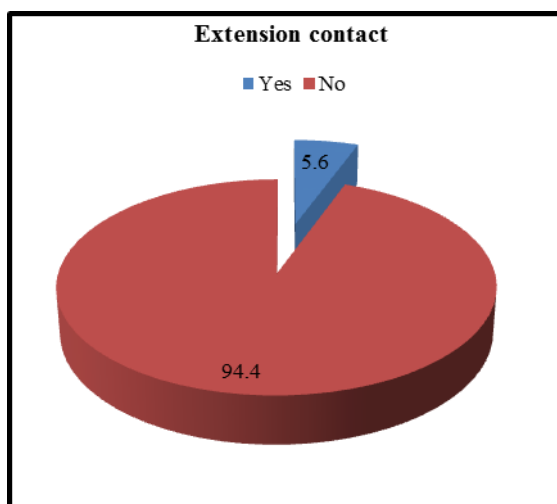


Fig. 5: Extension contact of respondents
Source: Field survey, 2017

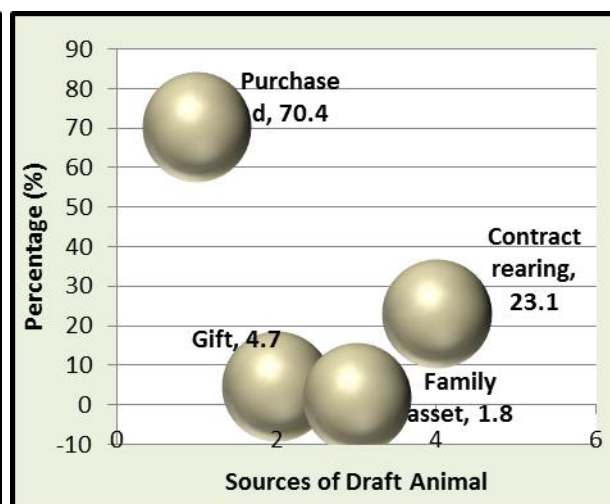


Fig. 6: Respondents' sources of draft animal

Economic utilization of draft animals by the respondents

The results in Figure 7 showed the perceived economic utilization of draft animals as indicated by the respondents include: drawing traditional plough (mean= 3.99), harness animals (mean=

3.86), for conveyance of material to farm site (mean=3.69), as food and other bye products after use (mean=3.55) and for erosion control (contour ploughing and terracing) mean of 3.46 and were ranked 1st, 2nd, 3rd, 4th and 5th respectively. Other perceived economic benefits include: as a means of transportation to the

farm (mean=3.32), reducing drudgery and increasing efficiency (mean=3.09), stimulating local trade and production (mean=2.98), carrying domestic fuel woods (mean=2.76), stimulating marketing of agricultural produce (mean=2.54) and social purposes during

wedding ceremony (mean=2.52). The variations in mean score indicate that there was no uniformity as regards the responses of the respondents. It shows disparities in the various economic utilization of draft animal by the respondents.

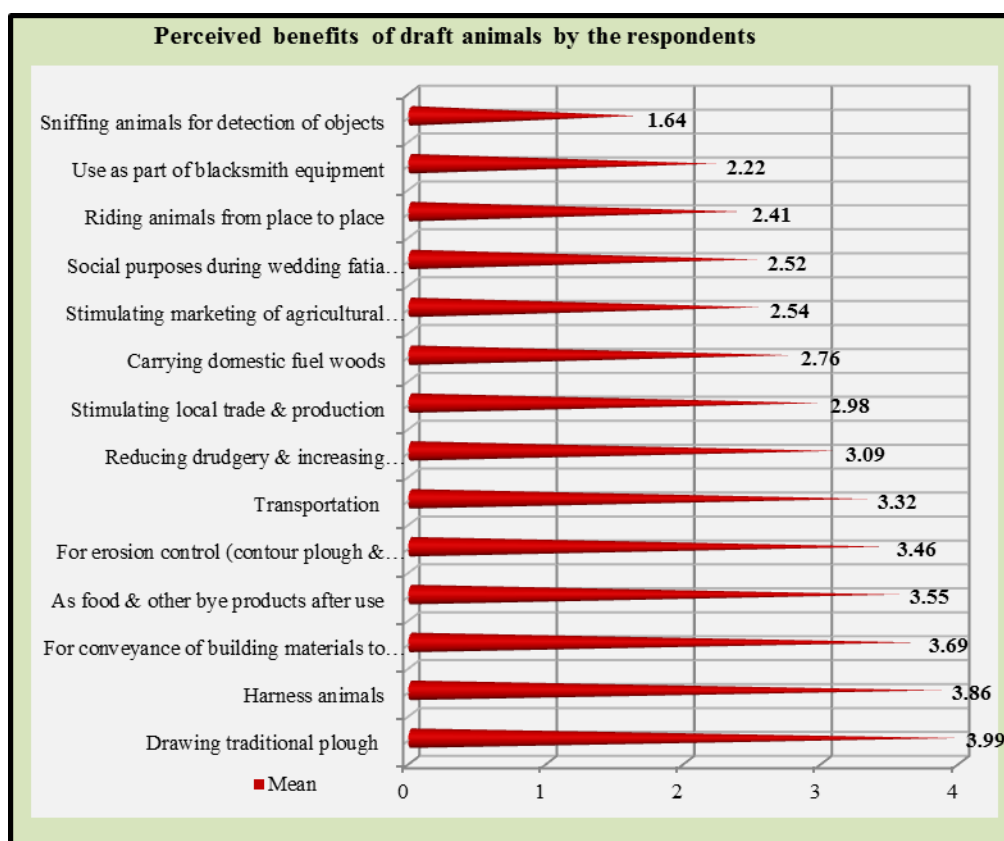


Fig. 7: Perceived benefits of draft animals by respondents

Source: Field survey, 2017

Information needs of the farmers on draft animals utilization

Figure 8 revealed that the withdrawal time for drug usage prior to consumption with mean score 3.99 and optimum usage of draft animals (mean=3.98) were ranked 1st and 2nd respectively as areas where the by the respondents highly need information. Others such as availability/application of drug usage (mean=3.68), dearth of improved knowledge on animals (mean=3.47) and animal health

management and nutritional requirement for the animals (mean=2.98) and sustainable types of feed (mean=2.53) were also considered among the areas of information needs by the respondents. Meanwhile, up to date management practices of draft animals (mean=2.02) and access to improved breeds of draft animals (mean=1.99) were considered as areas where the respondents information needs were minimal. They were ranked at the 7th and 8th position respectively.

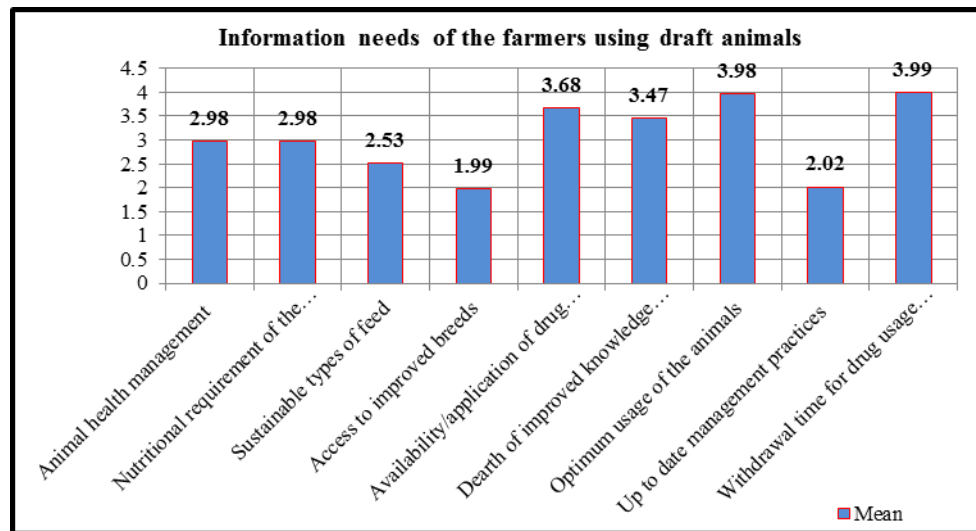


Fig. 8: Distribution of respondents by accrued benefits of draft animals

Source: Field survey, 2017 Mean= ≥ 2.5 information needed, ≤ 2.49 information not needed

Constraints to draft animal utilization by the respondents

According to the Table 1, lack of capital, current information on the animal (mean=3.698) was seen as the major constraints to the utilization of draft animals by the respondents. It was followed by the over utilization of the animals, lack of adequate of subject matter specialist and lack of adequately equipped veterinary contract offices (mean=3.693) and excessive adherence to culture and tradition by the respondents, lack of improved knowledge on the animal and

excessive labor requirements compared to tractor (mean=3.511). Significant proportion (mean= 3.238) engaged in excessive flogging and beating to get work done by the animals and lower efficiency at work then tractor. Access to and affordability of good drugs, inability to give balance ration and inadequate feeding/aesthetically clean water (mean=2.746) was followed by Lack of good housing facilities (mean=2.510) and theft (mean=2.373) were the major constraints to effective utilization of draft animals in the study area.

Table 1: Constraints to utilization of draft animals by the respondents

Constraints	Mean	Ranking
Efficiency is lower than Machine power (Tractor)	3.24	9 th
Required excessive labor to use compared to machine	3.51	6 th
Over-utilization of the animals	3.69	3 rd
Lack of capital to take care of/purchase new the animals	3.70	1 st
Lack of improved knowledge on animal health	3.51	6 th
Lack of current information on the animals	3.70	1 st
Problem of Theft	2.37	16 th
Snake bites on field	2.75	11 th
Access to/ affordability of good drugs for the animals	2.75	11 th
Lack of extension and subject matter specialists	3.69	3 rd
Lack of equipped veterinary contact offices	3.69	3 rd
Lack of good housing facilities for the animals	2.51	15 th
Inadequate feeding/aesthetically clean water for the animals	2.75	11 th
Excessive adherence to culture and traditional beliefs	3.51	6 th
Inability to give balanced ration to the animals	2.75	11 th
Excessive flogging and beating of animal to get work done	3.24	9 th

Source: Field survey, 2017

Chi-square analysis between the selected socioeconomic characteristics the farmers and the perceived economic usage of draft animals

As depicted in Table 2 only educational qualifications, farming experience, household size and farm size showed positive significance relationships with the utilization of draft animals. The implication of this is that the higher the education status, farming experience, household size and farm size the higher the level of understanding of innovations on the keeping and maintenance of draft animals, The higher the educational level, the more their understanding of the technicalities in keeping

the animals. This finding harmonizes with that of Idrisu *et al.* (2010) who stressed that education influenced adoption of improved draft animal practices. The higher the household size, the more the available man power for farming activities hence more usage of cattle. Finally, the higher the farm sizes the more the utilization of the animals. Agbo *et al.* (2015) and Umunna (2010), in the same opinion also agreed that education, household size, off-farm income and farming experience had significant relationship with farmer's productivity and knowledge in Owerri Agricultural Zone of Imo State, Nigeria.

Table 2: Results of Chi-square analysis showing the relationship between the selected socioeconomic characteristics of the farmers and their perceived usage of draft animals

Variables	χ^2 -value	d.f	p-value	Remarks
Education	0.152 *	3	0.043	Significant
Farm size	0.299*	3	0.069	Significant
Household size	0.431 *	4	0.037	Significant
Farming experience	0.199 *	4	0.039	Significant
Age	-0.113	3	0.477	Not Significant

Source: Field survey, 2017

P ≤ 0.05

Conclusion and Recommendations

The study revealed the various utilizations of draft animals. It ranged from transportation with oxen-cart to farmyard manure, fattening with major information gap on withdrawal time of drug usage, optimum usage, and availability/understanding of drug used for treatment of the animals. The major constraints to the farmer's use of draft animals were lack of capital to purchase and care for the animals and lack of current information on the animals. It is therefore, recommended that the capacity of the farmers should be strengthened and adequate information should be provided in the areas of usage and application of drugs, optimum usage of the animals, the withdrawal time to slaughter when drugs are used on the animals. Also, more extension personnel should be deployed to take

care these set of farmers, or the use of ICT to improve/reduce the information gap to help the farmers in current knowledge about the animal in question.

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