ANALYSIS OF UTILIZATION OF ANIMAL TRACTION POWER BY CROP FARMERS IN JIGAWA STATE, NIGERIA

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ABSTRACT

The use of animals for farm operations lighten human labour for farm cultivation, freight and transport thereby contributing immensely to the farm economy. The study was undertaken to analyse utilization of animal traction power by farmers in Jigawa State, Nigeria. Multistage sampling technique was employed to select 266 respondents from a total population of 3,3895 registered farmers using animal traction power. Information were collected using a structured questionnaire and interview schedule. Data collected were analyzed using descriptive and inferential statistics. The results revealed that all of the respondents were adult, married males with mean age of 25 years. A little over one-third of the respondents are literate with significant (75%) membership of associations. Also, 30.0% and 23.3% of the respondents have experience of animal traction power utilization of between 11-15 years, and above 20 years, respectively while 43% have farm size of not more than half (0.5) hectare. Over 60% inherited the farmlands. The study revealed that about 84% of the respondent' source of animal traction power are bulls. Tillage practices (44.41%), transportation (21.27%) and pulling sledges (15.06%) ranked first, second and third respectively, as the major farming operations traction power is employed for in the study area. Multiple regression analysis results shows that education level, farming experience and farm size had a positive and significant relationship affecting and influencing use animal traction by the respondents. Also, over one-third (38.8%) of the respondents were challenged by scarcity of feed resources and water while 20.3% were constrained by animal health issues. Therefore, the study concluded that animal traction power is a reliable means of farming operation utilized by small scale farmers that has the potential of uplifting the socio-economics standard of the farmers.

Keywords: Utilization, Animal traction, Power, Crop farmers, Jigawa

INTRODUCTION

In the twenty-first century, animal power still remains of crucial importance in developing countries. In fact, animal power is widespread in Asia, and Latin America and is expanding in Africa with surprising grown interest in animal traction power in developed countries spanning from United State of America to Europe. (Fuller and Aye, 2012). Animals have been reported to be involved in the socio-economic development of especially rural societies where they are used to create wealth in terms of food production and domestic work as transportation of people and goods (Mota-Rojas *et al.*, 2021). Animals tractions still remains a major source of livelihoods for millions of households in developing countries where rural households actively participate in the management of the animals. The use of animals for farm operations as ploughing, planting and weeding where they lighten human labour for farm cultivation, freight and transport thereby contributing immensely to the farm economy. Water, fuel carried by animals reducing drudgery especially for women thus releasing time that can be used in other productive or socially important tasks (Mota-Rojas *et al.*, 2021). Ihebe and Arikaibe (2012) had pointed out to the importance of animal traction in the food security of especially small holder farmers given that animals traction exist in all regions of the world thereby assisting in the creation of wealth and reducing drudgery (Musa, 2004). Animal power is generally accessible and affordable to the small holder farmers, who constitute a significant proportion of world agricultural food production (Bello *et al*., 2012). Animal traction technology could be said to be an important

component of tractorisation and agricultural mechanization in Sub-Saharan Africa where they are major sources of farm power for the rainfed and irrigated farming system of SSA. This is especially true given the increasing labour shortages in most rural farming communities as observed by Bello *et al*. (2012).

Studies have proven how animal traction is labour-saving per acreage when compared to hoe cultivation (Ambros, 2008) where Kate (2009) studies shows how a family with 2 work bulls can handle the area 4-5 times done by hand cultivation. The current economic realities has made manual cultivation and tractorisation untenable and unaffordable thus proving the imperative need of animal traction power for farm operations of small holder farmers who constitute the majority of the farmers in Nigeria (FAO, 2017). Studies have shown how animal traction is showing promising sign of being ecologically sustainable way of increasing agricultural production (Dube and Mulder, 2014). Animal traction power has been used in the Guinea and Savannah vegetation zones of Nigeria taking advantage of the technologies for a number of purposes. In many areas where animal traction power is used, it is mainly specifically applied for primary tillage thereby bringing more land under cultivation compared to the use of hand tools. It is against this background that this studies seek to assess the utilization of animal traction by crop farmers in Jigawa State, Nigeria with the specific objectives describing the socio-economic characteristics of the respondents, identifying types of animals used in the traction and associated farming operations. Other specific objectives include factors influencing use of animal traction and constraints in the use of animal traction by the respondents in the study area.

MATERIALS AND METHODS

Jigawa state is one of the 36 states that constitute Federal Republic of Nigeria. It is located in the north western part of the country between Latitudes 11^0 N to 13^0N and Longitudes 8^0 E to 10.15^0E. Jigawa state borders Yobe state to the northeast, Bauchi to the southeast and south, Kano to the southwest and Katsina to the northwest. Jigawa state also shares an international border with Zinder region in the Republic of Niger, which is a unique opportunity for cross border trading activities (Wikipedia, 2017).

According to the Nigeria Bureau of Statistics (NPC, 2006) Jigawa state had a population of current projected population estimate of the state is 7,373,187 in 2020 with a growth rate of 2.9% per annum. Also, about 80% of the total population found in Rural areas (Garba *et al*., 2012) with close to 90% of the population mainly engaged in rural and subsistence farming. Jigawa state is also blessed with large expense of agricultural land, rivers, and flood plains suitable for crops, livestock and fish production. Based on this over 80% of the state's total land mass is considered arable. And this makes it one of the most agriculturally endowed states in Nigeria (Jigawa Ministry of Agriculture [JGMA], 2013).

The major agricultural seasons in Jigawa state are the rainy and dry season. The rainy season lasts almost from May to September with an average rain fall between 600-1000mm and high temperature are usually recorded between April and September (Garba *et al*., 2012) Rain fed crops includes millet, sorghum, cowpea, cassava, ground nut, sesame, rice, maize, sweet potatoes, Bambara nut, cotton, okra, Roselle and water melon and the dry season farming production (crops) includes Tomatoes, pepper, onions, wheat, sugarcane, carrots, cabbage, lettuce, maize, and host of other leafy vegetables (JGMA, 2013).The socio-cultural state of affairs in Jigawa State could be described as homogeneous: it is mostly populated by Hausa and Fulani tribes, who can be found in all parts of the State. Kanuri are largely found in Hadejia Emirate; with some traces of Badawa mainly in its North-eastern parts (Jigawa Wikipedia, 2017). The study was carried out in Jigawa State.

The population of the study comprised farmers that utilizes animal traction as a form of farm power in the farming operations. The survey was conducted in the early rainy season of 2022. A total of 266 respondents spanned from three of the five zonal agricultural development areas were selected by using multi- stage sampling procedure from the population of farmers using animal traction power obtained from Jigawa Agricultural and Rural Development Agency. The districts selected for enumeration were Dutse and Kiyawa agricultural zones while Kachi, Madobi, Chamo, Andaza and Katanga were communities selected. It is from these communities that villages were selected as respondents. Interview schedule and questionnaire were the main instrument of primary data collection for the non-literate and literate respondents, respectively. Descriptive statistics and inferential statistics were used to achieve the objectives of the study.

RESULTS AND DISCUSSION

The mean age of the respondents was 24.7 years implying large proportion adult, married male of and young population using animal traction power affirming findings by Anthony et al. (2021) showing the near absence of female using animal traction. A little over one-third of the respondents can be said to be literate with significant (75%) membership of associations. Also, 30.0% and 23.3% of the respondents have experience of from traction power utilization of between 11-15 years, and above 20 years, respectively while about 43% have farm size of not more than half (0.5) hectare. with 28.5% working on farm sizes over two hectares while over 60% inherited farmlands.

Table 1: Types of Main Farming Operations Used with Animal Traction (n = > 266)

Farm operations	Frequency	Percentage
Carting	31	4.81
Logging	19	2.96
Pumping	19	2.96
Threshing	1	2.48
Tillage practices	286	44.41
Planting	24	3.73
Pulling sledges	97	15.06
Transportation	137	21.27
Weeding	15	2.33
Total	**644**	**100.00**

The study revealed that about 84% of the respondent' source of animal traction power are bulls with 3.6% and 0.76% power sourced from camels and donkeys, respectively. Tillage practices (44.41%), transportation (21.27%) and pulling sledges (15.06%) ranked first, second and third respectively, as the major farming operations animal traction power is employed for.

Education level (X_3), farming experience (X_5) and farm size (X_7) had a positive and significant relationship with use animal traction by the respondents implying that the farmers with higher farming experience could have more farm productivity by use of animal traction power as affirmed by Akinlade et al. (2011). This is the *a priori* expectation as more experienced farmers may have better skills and access to new information about improved farm practices and technologies. With respect to constraints to use of animal traction, over one-third (38.8%) of the respondents were challenged by scarcity of feed resources and water while 20.3% were constrained by animal health issues.

CONCLUSION

Based on the findings of this study, it can be concluded that animal traction power is a reliable means of farming operation utilized by especially peasant rural farmers serving as a reliable source of labour for farm and domestic operations thereby improving the socio-economic status of the rural people.

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