

## Full Length Research Paper

# Past, Present and Future of Animal Traction in the North West Region of Cameroon

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In the North-West Region of Cameroon, the traditional shifting cultivation system practiced in the yesteryears was threatened by constraints such as rapid demographic expansion and unplanned urbanization. Like in other countries south of the Sahara, the government of Cameroon introduced innovative farming methods geared towards increasing production and productivity while at the same time reducing drudgery. Measures to remove the constraints were introduced in 1970s' by the Project for the Promotion of Adapted Farming Systems based on Animal Traction (PAFSAT). PAFSAT promoted an Intermediate Technology adapted to the ecology and to the resources and knowledge of the local farmers. Animal traction (AT) has played and still plays an important role in meeting the power requirements of many parts of the developing world in general and the North West Region particular, because it is an appropriate, affordable, sustainable and intermediate technology requiring few external inputs and hence relatively low capital investment. This paper reviews the history of AT, its application in the day to day lives of farmers in the North West Region and prospects of future application.

**Keywords:** Animal traction, Intermediate Technology, Cameroon.

## INTRODUCTION

In Cameroon, agriculture is not only the major rural occupation, but is a way of life for the rural dwellers that constitute approximately 70% of the population. Agriculture contributes at least 30% of the Gross National Product (GNP) and almost 50% of the total annual exports (MINAGRI, 1990).

Agriculture contributes an estimated 20.6% to the Gross Domestic Product of Cameroon (GDP) and engages 70% of the labour force but 48% of the population still lives

below the poverty line. Because of its modest oil resources and favourable agricultural conditions, Cameroon has one of the best-endowed primary commodity economies in sub-Saharan Africa (Index Mundi, 2014). This notwithstanding, it faces many of the serious problems confronting other developing countries, such as stagnant per capita income, a relatively inequitable distribution of income, a top-heavy civil service, endemic corruption, and a generally unfavourable climate for business enterprise.

Despite the enormous available agricultural potentials and with the representation of all the agro ecological zones in the North West Region, only about 47% of the

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904,785ha arable land is effectively being cultivated (GP-DERUDEP, 2006).

One of the main challenges hindering expansion has been difficulties in opening up new farms due to the drudgery in farm operations amongst the rural farming population of Cameroon in general and of those of the North West Region in particular. The past decade has seen a significant reduction in the availability of farm power especially 'human muscle power'. This has further been depleted by a lack of interest in farming among the youth, who are seeking alternative employment in urban areas. Government operated tractor hire schemes have wallowed under the impact of structural adjustment as well as administrative bottlenecks involved in the hiring of farm equipment. In many areas the stock of draught animals has drastically reduced due to disease as well as the lack of capital for younger people interested in the technology to acquire trainable cattle and the required implements (Bishop-Sambrook, 2003).

Animal traction activities in the Region started in Ndop in 1968 and in RTC-Mfonta in 1969 and became a major extension programme of the Wum Area Development Authority (WADA) in the Menchum area. Animal traction was extended to the other areas of the Province in 1980. The Project for the Promotion of Adapted Farming Systems based on Animal Traction (PAFSAT) started in 1985 as a result of technical co-operation between the Republic of Cameroon and the Federal Republic of Germany. PAFSAT was an agricultural project that promoted animal traction as an appropriate technology and accessible natural resource which can accelerate the adoption of the permanent farming system being promoted by PAFSAT (Njei, 1987).

With demographic growth, shifting cultivation hitherto practiced by the farming population in the Region could no longer be used and the active work force has over the years been moving in their numbers into the cities to look for jobs thus leaving few people to work with rudimentary tools to feed themselves as well as the huge number of others swept by rural exodus to the cities.

Animal traction was introduced to permit the farmers practice permanent farming as well as to produce on larger farm sizes than with the hand hoe, and to reduce drudgery (Starkey, 1988). The Project has succeeded over the years to bring on board groups of people who hitherto never carried out any form of crop farming or did very little crop farming. The technology is therefore seen to be a bridge linking the traditional cattle grazing populations of the North West Region, (who are the Fulani nomadic populations – the Mbororos and the Akus), and the traditional crop farming populations. The AT technology is used as a tool to curb farmer-grazer conflicts which are very rampant in the Region (MIDENO, 2010).

In many cases, the technology has not expanded as expected because of the limited budgetary provisions assigned by the Government and other funders to the development organizations promoting the technology, and

administrative bottlenecks. Also, the organizations have their priority programmes depending on who is funding their project(s).

There has generally been a convergence of views that animal traction is more suitable for the North West Region not only because of the small farm sizes but equally due to the topography of the Region which is largely hilly with some few plains that could be suitable for tractorized farming (Langha, 1995).

Also, studies carried out on the 'Profitability of Animal Traction Investment: The Case of Northern Ghana' (Anthony, 1989) and 'Animal Traction and Small-scale Farming: A Stellenbosch Case Study' (Munyaradzi, 2011) have proven that animal traction is more profitable than the hand hoe. The analysis from the studies show that investing in animal traction is profitable because the investments give a higher Internal Rate of Returns (IRR) and considerably increase annual average incomes over those from hand hoe farming as well as relying on tractor hiring.

Constraints to Animal Traction may include limited or lack of appropriate implements, lack of spare parts, limited capital and credit, insufficient animals, animal health problems, inadequate animal nutrition (quantity and/or quality), uncleared fields, farmer traditions, limited or lack of technical knowledge, poor infrastructure and limited marketing possibilities. Most constraints can be overcome when other conditions are favourable and knowledge spread quickly through informal channels. Human labour can constrain crop production and Animal Traction relieves bottlenecks by switching labour between seasons. National development policies and interventions by aid agencies may stimulate Animal Traction but sometimes constrain it.

Despite the positive impact of Animal Traction and the economic/social activities (training of women groups on income generating activities as well as provision of corn mills on credit basis to selected groups, etc.), the Promotion of Adapted Farming Systems Based on Animal Traction (PAFSAT Project) had on Agricultural Development and on the livelihood of the concerned farmers in particular, the Federal Republic of Germany which introduced the technology into the North West Region stopped sponsoring the Wum Area Development Authority's (WADA's) activities in 1980. PAFSAT activities shifted to the Provincial headquarters – Bamenda, and operated as an elaborate Project called Promotion of Adaptive Farming Systems Based on Animal Traction in the North West Province (PAFSAT/NWP), with a completely different Protocol Agreement between the Republic of Cameroon and the Federal Republic of Germany signed in 1985. This Project was under the Ministry of Agriculture i.e. under the Provincial Delegation of Agriculture. The project had difficulties acquiring funding and as a result, follow up of the clients became irregular and many of the loan clients defaulted in their payments.

This accounts for the many outstanding loans of the early phase of PAFSAT up to date.

From April 1986, the Ministry of Agriculture ordered the transfer of PAFSAT to "Mission de Development du Nord Ouest" (MIDENO) and this became effective in July 1986 and was followed by a protocol agreement between MIDENO, PAFSAT and the Provincial Delegation of Agriculture in April 1987.

MIDENO has over the years been ensuring that PAFSAT continues to assume its original role as well as to continue towards attaining the general objective of ensuring sustainable improvement of the farming systems of farmers in the North West Region with a view of increasing farm sizes and establishing permanent farms. More specifically, the former Project is now under the Technical Department and specifically in the Division charged with Agricultural Development (i.e. under the Service for Permanent Farming Systems) in MIDENO, with emphasizes on:

- Soil conservation/erosion control and soil fertility enhancement through various techniques;
- Integration of women and youths into agricultural development;
- Use of draught cattle and improved implements for farm work by Farm Families;
- Self-reliability among the farming population; Etc.

The intermediate technology can be said to have undergone evolution from its introduction into the then North West Province by the Germans in the early seventies in Wum Area Development Authority Wum (WADA). At this initial stage, it was characterized by a limited outreach, mainly German experts but with good support to the beneficiaries. It was changed to the Promotion of Adapted Farming Systems Based on Animal Traction (PAFSAT/NWP) with extended outreach to other areas in the Province and with increased number of training sites but still maintaining its headquarters in Wum. From here, the headquarters was transferred to the Provincial headquarters, Bamenda with a reduction in the number of German experts and co-management with Cameroon experts. At this point in time, the Project was put under the Regional Delegation of Agriculture. It was later transferred to MIDENO as mentioned earlier and it became a Sub Project with some autonomy. Over the years in MIDENO, it has had changes in names and magnitude but most people in the Region still refer to it as PAFSAT which has over the years been a household name because of its effects on the lives of its users in particular and the Region as a whole (MIDENO, 2011).

## **METHODOLOGY**

The North West Region is situated between latitudes 5°40'N and 7°00'N and longitudes 9°20'E and 10°30'E. It is bordered to the southwest by the Southwest Region, to the

south by the West Region, to the east by the Adamawa Region, and to the north by the Federal Republic of Nigeria. The Region is made up of seven Divisions namely: Boyo, Bui, Donga Mantung, Mezam, Momo, Menchum and Ngoketunja Divisions (Figure 1).

The data sources employed for the study included collection of data from both secondary and primary sources. Secondary data was collected from existing literature in the North West Development Authority office, delegations of agriculture and livestock and google search engine. The primary data was collected on the field through administration of a structured questionnaire to the users of the intermediate technology, observation of field realities with oxen farmers and conducting interviews with some selected institutions supporting or promoting the technology (that is using observation guides and interview guides respectively). The Institutions consulted included two of the Divisional and one Sub Divisional Delegations of Agriculture for the sampled Divisions, Heifer International, SIRDEP, Subject Matter Technicians (SMT), and the Regional Delegate of Agriculture and Rural Development North West Region. The purposive sampling method was used to come up with the sample from the sampled population. Collected data from the study was manually stripped, coded and after quality control entered into SPSS (Statistical Package for Social Sciences) Version 17.0 software for statistical analysis.

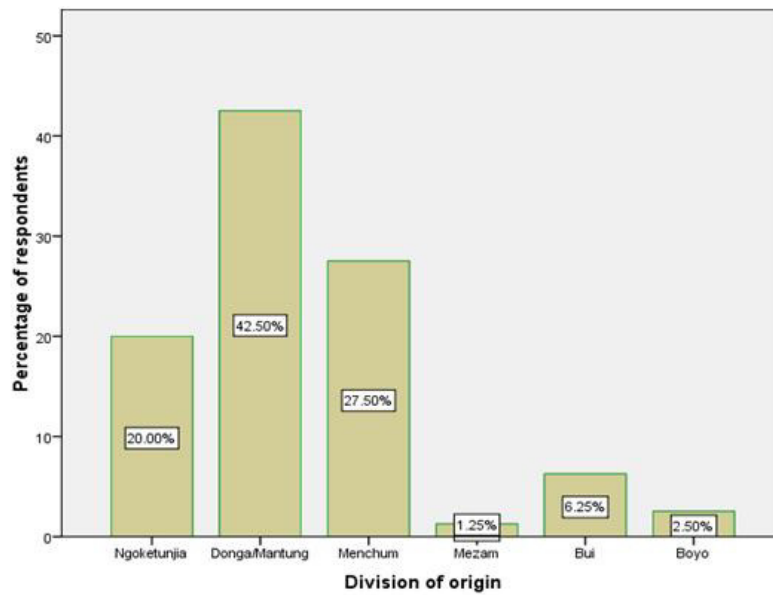
## **RESULTS AND DISCUSSION**

Donga Mantung and Menchum Divisions had the highest number of animal traction farmers (Figure. 2) may be due to the land availability, poor state of roads, good climate and trainings received by farmers from these two divisions. It should be noted that animal traction started in Wum (Menchum) and was later expanded to Mbiyeh in Ndu Sub-Division of Dong Mantung Division For gender, 96.25% of the respondents were males and 3.75% were females (Figure 3). Animal traction is carried out by a man and his wife or wives; with the children coming in for feeding of the animals or assisting in the farm. It was however interesting to note that the Fulani men in Menchum and Donga Mantung Divisions work with their male children. Also, the women who were seen practicing animal traction were mostly widows or came in because their spouses were down with health problems. This situation is different from what obtained at the beginning when the AT technology was introduced into the Region as there were many women groups who took loans for oxen and implements and used the technology on their group farms as well as on their individual farms.

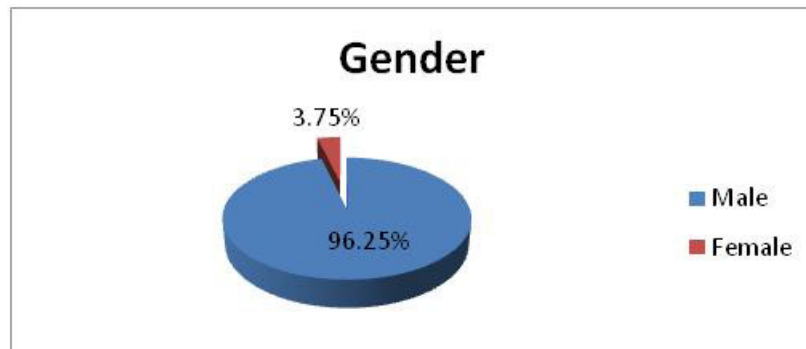
The percentage of the farm family members assisting the family head in using or caring for the draught animals are presented on figure 4. The spouses (wives) and children constituted the majority (43.75%). This is because the use



**Figure 1:** Map of the North West Region with Divisions and Sub-Divisions



**Figure 2:** Distribution of respondents according to Division of origin



**Figure 3:** Distribution of Respondents by Gender



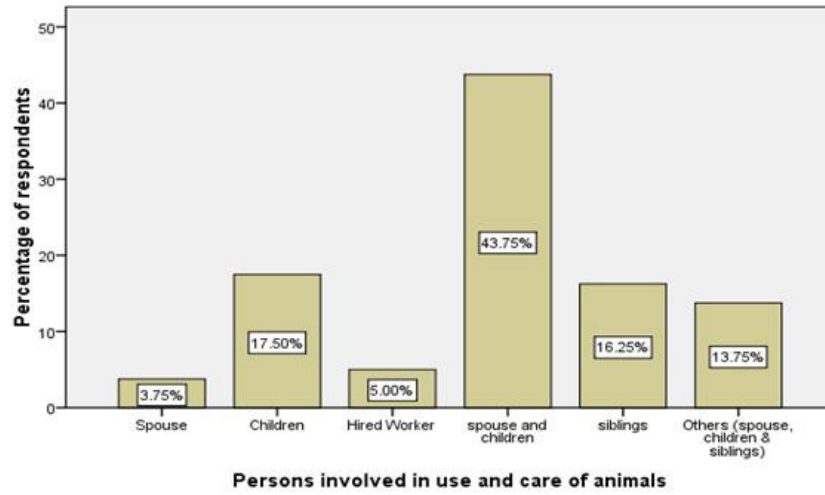


Figure 4: Distribution of Persons Involved in Animal Use and Care



Picture 1: AT Farm Family (a man with his wife doing land preparation in Wum, Menchum Division)

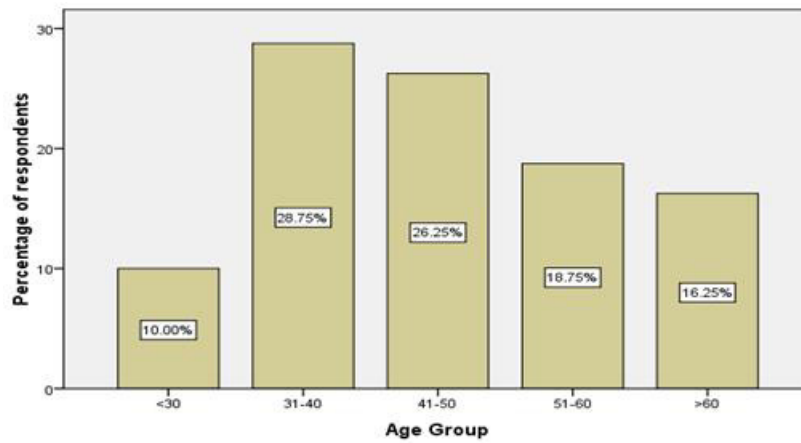
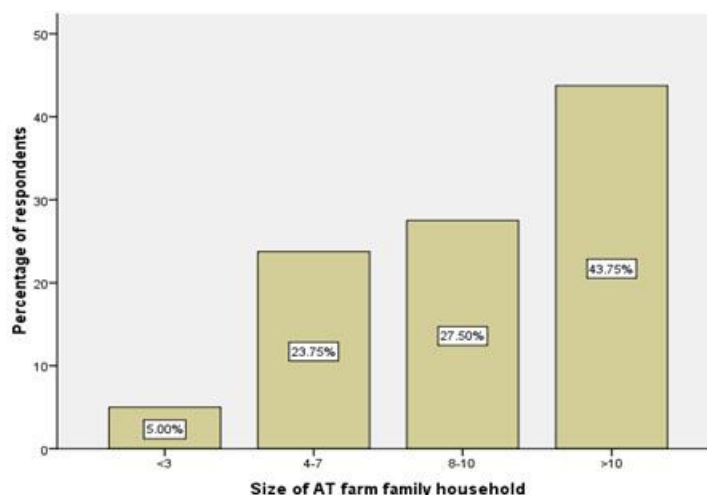


Figure 5: Distribution of respondents according to age groups

**Table 1: Distribution of respondents according to level education**

<b>Educational Level</b>	<b>Frequency</b>	<b>Percentage</b>
No formal Education	33	41.25
Primary school graduates	40	50.0
Secondary school graduates	6	7.5
University	1	1.25
<b>Total</b>	<b>80</b>	<b>100.0</b>



**Figure 6: Distribution of respondents according to size of farm family household**

of animal traction in agricultural production involves the farm family as a unit.

Most respondents were 31-40 years old (Figure. 5). Farmers have been passing down the technology to their offspring. This has made animal traction a way of life for most families. The fact that the highest numbers of farmers are young is an advantage as they will be able to encourage their neighbours and train their children for the technology to be sustainable.

The number of respondents who are at least primary school graduates (Table 1) constituted 58.75% of the respondents (Table 1). This shows that the farm families have the capacity to assimilate the training given to them during formal training sessions.

From Figure 5, 43.75% of respondents have household sizes of more than 10 persons. By implication, those respondents with big household sizes have the greatest percentage, substantiating the fact that some of them grow food mostly for household consumption as is the case with most of the Fulani Farm Families (Figure 6).

Farmers adopted animal traction to increase their farm sizes (46.25%), thus increasing their wellbeing (Figure. 7). Another group embraced the technology (37.5%) because they wanted to increase their farm sizes as well as reduce drudgery since it is very difficult to do so with the help of the hand hoe.

More than half of the farmers heard of animal traction from other farmers who have been practicing animal traction (Figure 8) while a third got their information from subject matter specialists. Heifer international from which most of the older Fulani AT farmers in Wum got their first knowledge on AT from is the main non-governmental organization that has trained Lake Nyos survivors on animal traction as a means of creating an alternative source of income.

The respondents, who have used AT for more than 15 years (Table 2), constitute the majority i.e. 55%. Oxen farming has been a way of life for farmers and the older people have acquired technological experience that they pass on to the young generation who have been practicing

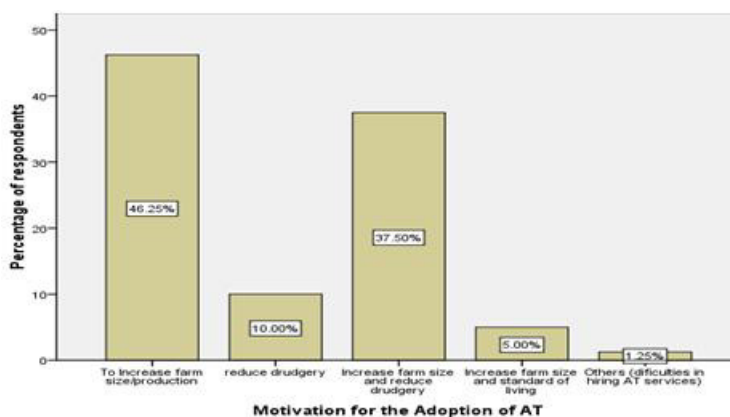


Figure 7: Motivation for the Adoption of AT

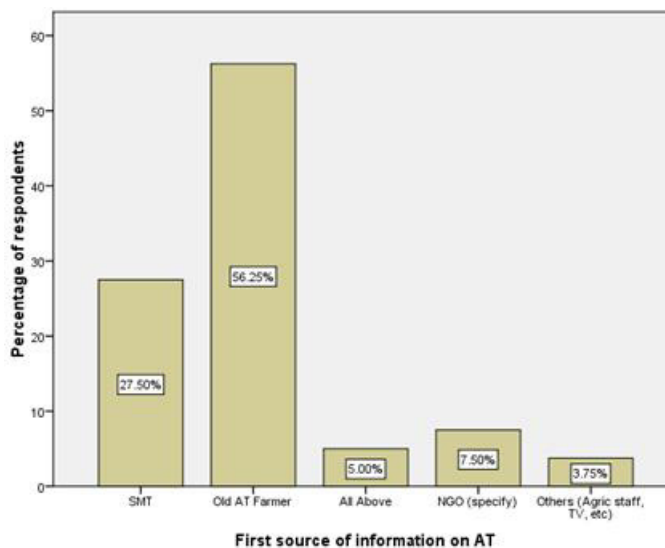


Figure 8: First source of information on animal traction before going in for the technology

Table 2: Duration of Use of AT by Farm Families

N° of Years	Frequency	Percentage
≤ 5	21	26.2
6-10	7	8.8
11=15	8	10.0
>15	44	55.0
<b>Total</b>	<b>80</b>	<b>100.0</b>

the new technology for less than 5 years. The adoption of animal traction technology is to increase agricultural production through the increase of surface area cultivated in the existing farms or creating new ones.

Ninety percent of respondents (Table 3) hire out animal traction services which goes a long way to increase access to the technology by those without animals or implements but it might not be very timely as they would have wished.

Table 3: Hiring of AT Services by Farm Families

Farmers' Responses on Hiring of AT	N <sup>o</sup> of Respondents	Percentage
Do not hire out AT services	8	10
Hire out AT services at times	72	90
<b>Total</b>	<b>80</b>	<b>100</b>

Table 4: Number of Oxen Owned by AT Farmers (take up after training)

Oxen Owned	Frequency	Percentage
0	13	16.2
1	41	51.2
2	17	21.2
3	7	8.8
4	2	2.5
<b>Total</b>	<b>80</b>	<b>100.0</b>

Table 5: Ease of Acquiring Spare Parts in the Community

Response	Frequency	Percentage
No	79	98.8
Yes	1	1.2
<b>Total</b>	<b>80</b>	<b>100.0</b>

Also, non animal traction farmers make use of the technology. This is a good source of income for owners of animal traction implements and thus contributes further in widening their income base.

According to Table 4, 83.8% of the respondents owned at least a pair of oxen. This implies that a high percentage of AT farmers are able to produce much food with the use of the technology. On the other hand, 16.2% of the respondents had no oxen and risked missing some of the planting seasons because they relied on hiring of the AT services from the other AT farmers who may be so busy with their oxen or may not be willing to hire out their oxen during peak production seasons. The farmers who own 2, to 4 pairs of oxen make a total percentage of 32.5% and could contribute enormously to agricultural development as they could afford to hire out their AT services even to interested members of their communities. Owning more than one pair of oxen was seen to be a sort of guarantee to ensure regular availability of healthy draught power for required work. Also, some farmers had relay pairs of oxen to be used for replacement when the older pairs could no

longer efficiently deliver the goods, in which case they are sold for meat

From Table 5, 98.8% of the respondents testified it is not easy to acquire spare parts in their communities nor in the Region. This ties with the literature on the fact that lack of or limited spare parts in subsaharan Africa, constitute the major draw back to the advancement of the technology (Blench, 1997). This corroborates the discussion of the CIRAD, 2003 sponsored workshop in Burkanisa Faso that Governments in West Africa (Cameroon inclusive) had withdrawn the support earlier given to the AT sector; the *raison d'être* for the workshop to come up with strategies to get the private sector interested and implicated.

With the high percentage difference for the "No" (98.8%), there is uncertain supply of the spare parts to the AT farmers. WADA/PAFSAT/MIDENO the structure that introduced and has been training farmers on the use of AT has not put in place a sustainable mechanism for spare parts production and distribution. According to Harouna *et al.*, "Lack of appropriate implements can be an important constraint to the use of Animal Traction and farmers have



sometimes found it difficult or impossible to obtain suitable equipment”.

Repairs have become very difficult for AT farmers thus artisans are bound to improvise methods of fabricating, maintaining obsolete implements and replacing broken parts. There is bound to be difficulties in increasing or expanding farm sizes due to the drudgery in farm operations like land preparation, weeding, and transportation of inputs and farm produce amongst AT farmers. This situation is completely different from what obtained when the technology was introduced in WADA Wum; as there was a department charged with maintenance as testified by the older farmers and SMTs.

With all the above difficulties, planting seasons; the farmers testified could be missed and some of the farmers may be forced to go back to the hand hoe method of cultivating their farms which is not only tedious and time consuming but leads to low production and thus misery especially for the male folks.

A number of other problems include: lack of suitable equipment, uncertain supply of equipment and spare parts, poor harnessing techniques, land shortage and difficult terrain, very short marketing calendar and the farmer's inability to use other farm inputs such as fertilizers and improved seeds.

The Government of Cameroon with the support of some of its development partners has made strong strides to enhance mechanization of agriculture in the country as a whole and in the North West Region in particular in order to reduce drudgery and improve the performance of agriculture but has in most cases failed (Langha, 1995). This is due to the fact that most of the farming populations in the country and especially in the North West Region, cultivate small patches of land (about 0.25ha) sparsely distributed or fragmented and thus are generally not suitable for tractorization. Despite the much talked of elite farming or second generation agricultural policy of the Ministry of Agriculture and Rural Development, and the creation of tractor equipment pools in the production basins of the national territory, very few farmers have access to the equipment because of the procedures involved in accessing them. Also, most farmers are unable to make use of the equipment because of the poor state or lack of access roads to their farms as well as the high cost of fuel which renders mechanization out of their reach.

The intermediate technology (i.e. animal traction) which is comparatively cheaper and much more suitable for the terrain of the study area, has not been exploited to the fullest despite its acceptance over the years in the North West Region. Most of the farmers still thriving with the technology are using implements that came into the Region since its time of introduction in the seventies (70s) to the eighties (80s) and thus improvising spare parts which are not always the most suitable. This has mainly been due to the fact that funding for the technology has been dwindling over the years and there has been no

sustainable package put in place by the Government to get the implements and spare parts produced locally in the Region (The Henry Ford, 2011).

In addition to the problem of implements and spare parts, most agricultural training institutions in the country, impart very little or no information on animal traction unto the trainees (future frontline agricultural extension staff). This makes close follow up and technical assistance of oxen farmers difficult because there is only one Subject Matter Technician (SMT) per Division in five of the seven Divisions of the North West Region who are staff of the North West Development Authority (MIDENO) from its French acronym). Some of these SMTs are already approaching retirement as they were those trained by the German experts before handing the Project to the Cameroon Government in the eighties.

Few farmers can afford to purchase the animal traction package because they have very limited access to loans as most Micro Finance Institutions in Cameroon consider agriculture as a risky business. Another problem has been the rapid increase in the cost of implements or their scarcity to near non availability.

## **CONCLUSIONS AND RECOMMENDATIONS**

The animal traction programme has to an extent attained its goals, the limited means notwithstanding thanks to the philosophy of training, follow up and post training services. This is the more reason why the North West Development Authority continues to ensure that funds are made available for the training and follow-up of Farm Families on this intermediate technology despite the limited budgetary provisions to the Authority.

The technology though cherished by many farm families in the North West Region is said to be expensive for them to acquire on cash basis (at least 500,000FCFA for the entire unit - 2 trainable cattle and implements). The farm family is expected to acquire the trainable cattle, is trained and pays for the tools (which are not easy to come by) on cash basis after the training.

Also, the affordability of animal traction and its simplicity and versatility can allow individual farmers to benefit from it in ways that can promote household and national food security. It is imperative that the government recognizes animal traction as an appropriate power source for agriculture in Cameroon in general and the North West Region in particular.

- There is a need for greater Government support in terms of a definite animal traction policy as well as training, research, development and extension in animal traction
- Reconsider animal traction as a source of power that could complement tractor power.
- Ensure organization of national or regional networks of the animal traction value chain to facilitate information exchange and cooperation. The network will

unite farmers, researchers, manufacturers of implements and spare parts, development workers, NGOs and institutions dealing with animal traction throughout the country or the North West Region.

- Institutions of higher learning, especially those concerned with agricultural engineering need to play a major role in designing implements and training artisan craftsmen in the manufacturing of AT implements.

- The Government needs to create centres for innovation and skills transfer in communities. This can be done through organization of training workshops and short-term or long-term training courses in animal traction implement production.

- Exchange visits and oxen farmers' field days need to be encouraged and sponsored by the Government and other development stakeholders as it goes a long way to positively impact on the lives of interested AT users

- Farmers and other members of the private sector, should be motivated to take up AT value chain activities as a business

- More fulani pastoralists need to be encouraged to embrace the use of AT technology as many of are increasing becoming herdless due to cattle rustling

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