

Utilization of local trees and shrubs for sustainable livestock production in the Talensi-Nabdam District of the Upper East Region of Ghana

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Abstract

The study was carried out to investigate the indigenous knowledge of livestock farmers in the utilization of local trees and shrubs for feeding and meeting the health needs of livestock in the Talensi-Nabdam District during the periods of December 2005 to January 2006. Eighty (80) households from eight (8) communities were selected for the study. Data was collected through the use of semi-structured questionnaire and observation. In all 31 species of trees and shrubs were used by farmers in feeding and medication of livestock.

Acacia albida, *Ficus gnaphalocarpa* and *Mangifera indica* were the trees most used for feeding whilst *Ceiba pentandra*, *Cactus spp*, *Vetex doninana*, *Boscia sengalensis*, *Securitaca longepedunculata*, *Acacia niloticass*, *Khaya senegalensis* and *Vitellaria paradoxa* were used mostly for treating different ailments in animals. Efforts at conserving these trees and shrubs were encouraging since 66.25% of the respondents established and managed some of these trees and shrubs around their homes for livestock feeding and other multi-purpose use. In conclusion, farmers had adequate knowledge in the use for trees and shrub as feed and medication for livestock. More farmers should be encouraged to cultivate these trees and shrubs to avoid extinction of palatable trees for sustainable use.

Key words: Feeding, Indigenous knowledge, Multi-purpose trees, Medication, Tree conservation

Introduction

Livestock production is an important feature of Ghanaian agriculture and constitutes a major national resource. Livestock contribute 7-9% of the national agricultural gross domestic product (GDP) and provides 30% of domestic meat supply. It provides draft power and generates income. Livestock is an important source of food and income for millions of people. For many, animals are a source of income, food, clothing and labour. For example in the Northern Regions of Ghana, livestock serve as buffer against food shortages, provide cash security and play an important role in their socio-cultural activities (Awuni 2003). Northern Ghana is said to carry about 75% and 45% of the national herds of cattle and small ruminants respectively (Koney 1992).

However, the development of the livestock industry to optimal level in many developing countries continues to face several setbacks. Among these impediments are irregular availability of feed and water and occasional shortage of basic but important drugs and inadequate extension and veterinary personnel. Of these, animal nutrition (feed) particularly during the dry season and animal health (medication) has been identified as major factors that cripple the traditional and modern livestock production in Ghana (Koney 1992).

The rainfall pattern in Northern Ghana is unimodal. The Northern and Coastal savannas constitute the major livestock production areas in Ghana. These areas are characterized by a dry season of about 4-5 months duration every year when there is a drastic decline in both quality and quantity of grasses (Otchere *et al* 2002). Animals normally put on weight during the rainy season because during the dry season, animals only have straw from grass, which are poor in quality and may result in avitaminoses, mineral deficiency and severe debilitation. A study conducted by Ghanaian-German Agricultural Development project in Northern and Upper regions revealed that the natural grasslands can hardly be said to be productive. They are unable to support the dietary requirements of our indigenous animal because the grasses are too fibrous and dry matter yield too low during the dry season. They indicated that Ghanaian pastures are predominantly grasses with few or no legumes to provide nitrogen and therefore to raise the nutritional status of the pastures, farmers should utilize browse or fodder trees and shrubs during the second half of the dry season (Agricultural Extension handbook 1977). According to Komwihangilo *et al* (1995), trees and shrubs are of value in agriculture as they have been used to feed as well as to meet the health needs of animals through the ages in the world's arid and semi-arid areas. Their roles become more important as the dry season becomes longer with decreasing mean annual rainfall.

It is in view of the above that this study is being carried out to access the indigenous knowledge in the utilization of local trees and shrubs by livestock farmers in the area of feeding and health in the Talensi-Nabdam District of the Upper East Region.

Specific objectives

- To identify the local trees and shrub species used in feeding livestock
- Determine the medicinal uses of these indigenous multi-purpose trees and shrubs in livestock production.

Materials and methods

Study area

The study was carried out between December 2005 and January 2006 in the Talensi-Nabdam District of the Upper East region of Ghana. The major inhabitants of the study area are the Talensi and Nabdams. The vegetation of the study area is characterized by grass and scattered trees of different kinds such as baobab (*Adansonia digitata*), Neem (*Azadirachata indica*), Shea nut (*Vitellaria paradoxa*), *Acacia spp*, Dawadawa (*Parkia biglobosa*) etc.

Most of the areas and farmlands in the district are occupied with rocks hence the low economic potential of the study area. The area experiences unimodal type of rainfall lasting from May to September. The average monthly temperature is about 30.⁰C with maximum of 42.⁰C in March and a minimum of 18.⁰C.

Source of data

Primary and secondary data were used in this study. The primary data were collected using semi structured questionnaire and personal observation. The secondary data was mainly from the UDS library and District forestry commission, Bolgatanga. The trees and shrubs were identified and named in the local language. Samples of the trees and shrub were collected and botanical names identified with the help of researchers in the Horticulture Department of the University for

Development Studies and Regional Forestry Commission, Bolgatanga.

Method of Data Collection

The study was carried out in eight (8) randomly selected communities. The communities were Zanlerigu, Pelungu, Sekoti, Nangodi, Winkogo, Gaari, Duusi, and Tongo. Ten (10) livestock keeping households from each community were purposively selected for the study. A semi-structured questionnaire was administered to the farmers. Personal observation was also used in the gathering of information on the use of trees for medication.

Data Analysis

Frequencies and percentages were computed from the data gathered using Statistical Package for Social Sciences (SPSS) software program and presented as tables and pie charts.

Results and discussion

Gender and Age distribution of respondents

The study revealed that 74% of the livestock keepers in the study area were males with 26% being females. The majority of the livestock farmers interviewed were between the ages of 40-60 (48.75%), 21.25% were between the ages of 20-39 whilst 39% were above 60 years old. Most of the youth between the ages of 20-40 will prefer other income generating activities such as migrating to urban areas to serve as potters. Livestock rearing is considered as a business for the aged from the results.

Utilization of local trees and shrubs for livestock feeding

The farmers were able to identify which tree and shrub species and which vegetative part the livestock favored. In all, 31 tree and shrub species were identified in the study area as fodder plants and medication for the livestock (Table 1). A similar report was made by the Ghanaian-German Agricultural Development Project of Northern and Upper regions (Agricultural Extension handbook (1977) and Yidana et al (1998).

Acacia albida was the most known tree species as indicated by 95% of the respondents. Some farmers collect the pods (fruits) of this tree species and use them to feed their livestock. Some people do collect the pods and send to market to sell. The leaves of *Acacia albida* have been reported to contain a crude protein of 16.5% (Hashim, 1990). The high crude protein could improve the digestibility of low quality rice straw consumed by ruminants in the dry season. It will eventually lead to an increase in the weight gain of the animals. Apart from *Acacia albida*, *Ficus gnaphalocarpa*, was reported to be known and used by 86.25% of the respondents. Its fruits and leaves were reported to be favored particularly by small ruminants. Other high-ranking species were *Mangifera indica*, *Lannea acida*, and *Acacia dudgeonia*.

The study revealed that *Anogeisus leiocarpus* was the least known species as indicated by 1.3% of the respondents. It was gathered from the study that farmers will choose a particular tree for feeding depending on its availability in the community and preference by animal. Most of these trees produced green leaves and some fruits throughout the dry season and could therefore serve as a reliable source of feed supplement for livestock in the dry season.

Table 1. Trees and shrub species used for feeding livestock in the Talensi-Nabdam District

Serial No.	Local name	Scientific name	Number of farmers	Percentage	Part utilized
1	Zaah	<i>Acacia albida</i>	76.000	95.000	Pods, leaves
2	Nkang	<i>Ficus gnaphalocarpa</i>	69.000	86.300	Fruit, leaves
3	Mongo	<i>Magnifera indica</i>	30.000	38.000	Fruit, leaves
4	Nsabig	<i>Lannea acida</i>	22.000	27.500	Fruit, leaves
5	Gonzeng	<i>Acacia dudgeonia</i>	16.000	20.000	Leaves
6	Neem	<i>Azadirachta indica</i>	15.000	18.800	Fruit, leaves
7	Tuo	<i>Adansonia digitata</i>	14.000	17.500	Fruit, leaves
8	Gompelig	<i>Acacia sieberiana</i>	13.000	16.300	Leaves
9	Taa-ag	<i>Vitellaria paradoxa</i>	12.000	15.000	Fruit, leaves
10	Leucaena	<i>Leucaena leucocephala</i>	12.000	15.000	Leaves
11	Kouk	<i>Khaya senegalensis</i>	11.000	13.800	Leaves
12	Nkanzie	<i>Ficus capensis</i>	10.000	12.500	Fruit, leaves
13	Njiring	<i>Acacia nilotica</i>	7.000	8.800	Leaves
14	Nkpalig	<i>Azalia Africana</i>	7.000	8.800	Leaves
15	Duo	<i>Parkia biglobosa</i>	7.000	8.800	Leaves
16	Samparang	<i>Celtis intrigrifolia</i>	7.000	8.800	Leaves
17	Gonwurig	<i>Acacia gourmaensis</i>	6.000	7.500	Leaves
18	Naa-tii	<i>Moringa olifera</i>	6.000	7.500	Leaves
19	Ngung	<i>Ceiba pentandra</i>	6.000	7.500	Leaves
20	Gaa	<i>Diospyrus mesipiliformis</i>	6.000	7.500	Fruit, leaves
21	Keko	<i>Balamites aegyptiana</i>	6.000	7.500	Fruit, leaves
22	Cassia	<i>Cassia siemia</i>	6.000	7.500	Leaves
23	Akee apple	<i>Blighia sapida</i>	5.000	6.300	Leaves
24	Aa-rig	<i>Vetex doniana</i>	5.000	6.300	Leaves
25	Cashew	<i>Anacardium occidentale</i>	5.000	6.300	Leaves
26	Pusig	<i>Tamarindus indica</i>	4.000	5.000	Fruit, leaves
27	Nasobra	<i>Gardenia equalla</i>	3.000	3.800	Leaves
28	Taalag	<i>Ficus inganus</i>	3.000	3.800	Leaves
29	Nkanzog	<i>Ficus iteophylla</i>	2.000	2.500	Fruit, leaves
30	Nunnobra	<i>Cyperus esculentus</i>	2.000	2.500	Fruit, leaves
31	Shie	<i>Anogeisus leiocarpus</i>	1.000	1.300	Leaves

Veterinary use of trees and shrubs

Farmers used different tree parts as medication for animals. The roots and bark of *Securitaca longepedunculata* are dried, ground into powder, mixed with water and the solution is given to animals suffering from bloat.

The leaves of *Ceiba pentandra* are also pounded fresh and put in water; the solution is then squeezed into the reproductive tract of a cow to induce the expulsing of retained placenta. The bark of *Khaya senegalensis* and *Vitellaria paradoxa* are used in the treatment of diarrhea in ruminants. Table 2 below presents some of the tree and shrub species identified by farmers in the study area used as medicinal plants for livestock. They were able to identify the nature of disease, the part of trees or shrub species used, the form it is used and specific animal treated. The use of ethno veterinary practices in meeting the health needs of animals could help reduce poverty. Most farmers because of the cost in using orthodox method of medication for their animals tend to lose their animals to curable diseases.

Table 2. Medicinal uses of some tree and shrub species for livestock production

Local name	Scientific name	Animal	Nature of disease	Usage form
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Ngung	<i>Ceiba pentandra</i>	Cow	Retained placenta	Leaves pounded, mixed with water and solution used to expel retained placenta
Boolori	<i>Cactus species</i>	Goats	Mange	Plants roasted, pounded and then used to smear affected skin parts
Dabokouk	<i>Not identified</i>	Ruminants	Sores	Leaves ground into powder ; apply the sores
Aa-rig	<i>Vetex doniana</i>	Calf	Scouring	Unripe fruit are pounded ; mixed with water which is then given to calf to drink.
Goong	<i>Boscia senegalensis</i>	Ruminants	Bloat	Tree bark and root are dried, pounded or ground and mixed with water introduced into animal's alimentary tract to treat bloat
Peelig	<i>Securitaca longepedunculata</i>	Ruminants	Bloat	Tree bark and root dried, ground and mixed with water ; introduced into alimentary tract of animal to treat bloat
Njiring	<i>Acacia niloticasss</i>	Ruminants	Eyes problem	Leaves or unripe fruits pounded and liquid is squeezed out in eyes to cure
Kouk	<i>Khaya senegalensis</i>	Ruminants	Diarrhea	Tree bark put in drinking water for animals to drink
Ta-ang	<i>Vitellaria paradoxa</i>	Ruminants	Diarrhea	Tree bark put in drinking water for animals

Availability and accessibility of trees and shrubs

Most of the tree and shrub species used for feeding and attending to the health needs of the animals were said to be available in the locality as indicated by 75% of the respondents. However, 25% of the respondents indicated that they have to walk about 3km before they can have access to the browse species for their animals.

Even though most of the trees and shrubs identified by the farmers are available in the locality, the farmers have problems accessing them (Table 3). The farmers assigned various reasons for their inability to access the trees and shrub (Table 3). The height of the trees, bulkiness and falling from the tree were the major hindrances to accessing the trees. The low involvement of women in keeping livestock in the locality in addition to other reasons could probably be due to the height of the browse species.

Table 3. Problems of accessing the trees and shrubs

Problem	Frequency	Percentage
Falling from tree	29.00	36.000
Bulkiness	28.00	35.000
Tree height	22.00	27.500
Snake bite	18.00	22.500
Distance of trees	15.00	18.750
Skin irritation	13.00	18.250
Scarcity of trees	9.000	11.250
Old age	4.000	5.000

Establishment of trees and shrubs

Out of 80 respondents, 66.25% established some local trees and shrubs for animal feeding and for other purposes. Some farmers kept a few stands of trees near their homes or in their fields especially the *Vitellaria paradoxa* and *Parkia biglobosa* although they did not plant them. These trees are kept purposely for their shade and fruits.

Among the trees and shrub established for fodder and or for any other purpose, *Mangifera indica* was the most species established by the farmers in the surveyed area as indicated by 25%. This could be due to its multi-purpose nature such as fruits, shade, firewood, windbreaks and fodder.

However, 33.75% of the farmers do not establish any tree species. They gave reasons such as, unavailability of seedlings, water problem, superstition, and slow growth of trees.

Table 4. Trees and shrubs established by farmers for fodder and other purposes

Tree species	Frequency	Percentage
<i>Mangifera indica</i>	20.000	25.000
<i>Leucaena leucocephala</i>	13.000	16.250
<i>Azadirachta indica</i>	5.000	7.500
<i>Moringa oleifera</i>	4.000	5.000
<i>Khaya senegalensis</i>	3.000	3.750
<i>Carica papaya</i>	3.000	3.750
<i>Cassia siemia</i>	2.000	2.500
<i>Blighia sapida</i>	2.000	2.500

Conclusions

- Farmers used different parts of trees and shrubs available in the area to feed and medicate their livestock.
- Majority of the farmers established some trees around their home and farms to serve different purposes including feeding and medicating livestock.

Recommendation

- It is recommended that farmers be trained on the establishment of tree plantations and the integration of livestock with tree plantations.
- Shorter varieties of useful trees and shrubs should be developed to reduce problems of accessibility.

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