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Production and Economic Benefits of Mini-Livestock in Adamawa State, Nigeria

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Abstract

Over the years, many large-scale/intensive government and donor-sponsored animal production projects in the tropics have proved to be unsustainable. Because of that, there is shortage of animal protein in Africa and Nigeria in particular. The broad objective of the study is to survey production and economic benefits of mini-livestock production in Adamawa state, Nigeria. The study used questionnaires, oral interviews and discussions to collect data. Data generated from the study was subjected to descriptive statistics such as tables, frequency distribution and percentages. Majority of the youths are the most engaged in the production of mini-livestock in the study area ages 10 to 40 years old with the highest recorded in Hong LGA (81%) while the least was from Mubi South LGA. Males are the predominant producers with Mubi South LGA recording the highest and lowest of 85% and 15% respectively. Rabbits, pigeons, grasshoppers and honey bees are the most popular in the study area. Mubi North and Ganye had the highest number of mini-livestock species with 8 each, followed by Mubi South (7) while Michika and Maiha had 6 each. There about 7 major economic benefits driven from the production of mini-livestock across the study area. The benefits include food,

manure, income, research, raw materials, foreign exchange and medicine. This study will help in creating awareness on the economic importance and food provision value of mini-livestock, which was neglected for centuries. This will also be beneficial to the government in policy making on livestock and agricultural products for sustainable development in Nigeria and Africa at large.

Introduction

The desire to expand food animal has brought mini-livestock production into the field of animal agriculture. Hardouin et al. (2003) asserted that over the years many large scale/intensive government and donor sponsored animal production projects in the tropics have proved to be unsustainable. Probably as a result of exorbitant initial capital outlay, large expanse of land required, high cost of feeding and management as feeding is known to be a major item of cost in animal production systems. To avert or reduce this negative trend, alternative livestock production should be sought (Hardouin et al., 2003).

New facts and ideas are being churned out every day from the agricultural research mills. These new facts and ideas (innovations) impact positively on the knowledge required to increase the efficiency of agricultural production, processing, preservation, distribution, marketing and family utilization of farm products in a nation. No matter how positively a new agricultural innovation impact on production and productivity, farmers will differ in their willingness to try it (Mafimisebi et al., 2006).

Before now, mini-livestock has been referred to as micro-livestock or unconventional livestock until 1992 when experts in the field of animal agriculture exchanged views and decided that only the term mini-livestock should be used when speaking of animals such as edible rodents, snakes, tortoise and turtles, lizards, guinea pigs, frogs, pigeons, quails, snails, manure worms, insects and similar animals when used for food, animal feed or as a source of income and other beneficial purposes (Opara, 2010).

Mini livestock refers to small indigenous vertebrates and invertebrates both domesticated and wild genetic animal resources which can be produced on sustainable basis for food, animal feed and as a source of income. They play an important role in farming systems by offering opportunities for risk coping, farm diversification and intensification and provide significant livelihood benefits including food security. Sub

Saharan Africa has considerable mini livestock species which could complement the increased demand for livestock products. Integrating mini livestock as a major livestock component for the resource poor livestock keepers could provide many direct and indirect benefits to ecosystem function and food sustainability (Bohringer, 2001; Devendran, 2004).

Amongst the vertebrates an important actual and potential source of meat is the edible bush rodents: in Nigeria cane rat, giant rat, brush-tailed porcupine; in the tangue; capybara, agoutis, coypu, *pacas* and *Cavia porcellus* (guinea-pig) which is widely bred and eaten in Nigeria. Other mini-livestock includes edible frogs, which are found in almost every humid tropical climate. Reptiles, snakes and birds have more recently been considered as eligible for mini-livestock status (Branckaert et al., 1992). The guinea pig (*Cavia porcellus)* is a member of the rodent which is related to the wild and semi domesticated cavia (Chauca de zaldivar, 1995). The name guinea pig is generally thought to have originated some centuries ago as British sailors carried this curious specimen resembling a young pig from South America to Britain through the port of Guinea in West Africa. This explains how this animal got the name guinea pig in English (Morales, 1994). While the invertebrate commonly consumed in Nigeria are insects such as the grasshoppers, locusts, termites, snails and honey from bees.

Over the years many large-scale/intensive government and donor-sponsored animal production projects in the tropics have proved to be unsustainable. Because of that, there is shortage of animal protein in Africa and Nigeria in particular.

The broad objective of the study is to survey production and economic benefits of mini-livestock production in Adamawa state. The specific objectives are to:

i. Determine the socio-cultural characteristics of mini-livestock producers in the study area
ii. Determine the species of mini-livestock produced in the study area
iii. Determine the common mini-livestock consumed in the study area
iv. Investigate the economic benefits driven from mini-livestock production

MATERIAS AND METHODS

The Study Area

Adamawa is one of the six states forming the North east geo-political zone of Nigeria. According to historical source, it lies between latitude 7^{o} and 11^{o} N of the equator and between longitude 11^{o} and 14^{o} E of the Greenwich meridian. The state has minimum

and maximum rainfall of 750 and 1050 mm per annum and an average minimum and maximum temperature of 15^0C and 32^0C, respectively. The relative humidity ranges between 20 and 30% with four distinct seasons that include early dry season (EDS, October – December); late dry season (LDS, January – March); early rainy season, (ERS, April – June) and late rainy season (LRS, July – September), according to Adebayo (1999). The vegetation type is best referred to as guinea savannah (Areola, 1983; Adebayo & Tukur, 1997). The vegetation is made up of mainly grasses, aquatic weeds along river valleys and dry land weeds inter-spersed with shrubs and woody plants. Plant heights ranges from few centimeters (Short grasses) to about one meter tall (tall grasses), which form the bulk of animal feeds. The state covers a land area of about 39,972km (Adebayo & Tukur, 1997) with a population of 3,168.101 (NPC, 1990). Adamawa state as it is today was curved out of the defunct Gongola state on August 27th 1991. Gongola state was itself curved out of the then North-eastern state in February 1976. Yola, the capital city of Adamawa state founded by Modibbo Adama in 1841 and had served as the headquarters of the pre-colonial Emirate of Fambina.

Yola had also served as a seat of the then Adamawa province from the colonial era to 1976, since the creation of Gongola, and subsequently Adamawa state. Yola (and its twin settlement, Jimeta, 6km due north) became the capital of both the state and local government of Yola North and South. The River Benue divides Adamawa state into almost two equal halves; each half having varying types and extent of land forms, one of which is valley troughs, such as the river Benue and its tributaries like River Gongola, song and Kilange on the northern flank and River Ini, Belwa and Faro on the southern bank (Adebayo & Tukur, 1997; Adebayo, 1999; ASMLS, 2010b). There are different religious beliefs including Christians, Muslims and some traditional worshipers. The major occupation in Civil servants, Farmers, Business men/women, fishermen and the minilivestocks produce in this region are poultry, guinea pig, rabbit, fish production and snakes.

Study Population and Sites

This study targeted at 700 respondents aged 18 years and above, spread across the 7 local government areas of Adamawa State. The 7 local government areas include Michika, Mubi North, Mubi South, Maiha, Hong, Gombi and Ganye respectively

representing North, Central and Southern Senatorial Districts. The choice of the study sites were purposeful based on proximity where the individual student came from.

Sampling Techniques

The sample size of 700 and 100 from each LGA were drawn using simple random sampling techniques.

Data Collection

The study used questionnaires, oral interviews and discussions to collect data. The selection of these instruments was guided by the nature of data to be collected, the time available as well as the objectives of the study.

Sampled respondents were interviewed at their respective places of choice. Most of the interviews were conducted during the weekend except for institutions. This is because, many people tend to remain indoors during weekends, thus they are easily accessible to provide the information required. The questionnaire had questions on the background information of respondents, the production and economic benefits of mini-livestock in the study area.

Data Analysis

Data generated from the study was subjected to descriptive statistics such as tables, frequency distribution and percentages.

RESULTS AND DISCUSSION

Socio-Cultural Characteristic of Mini-Livestock Producers

a. Age Distribution

The results showed that, majority of the youths are the ones mostly engaged in mini-livestock production in the study area. Ages 10 to 40 years old predominated the number of the min-livestock producers with the highest recorded in Hong LGA (81%) while the least was from Mubi South LGA respectively (Table 1). This could be connected with the small size of mini-livestock which means a small amount of input per unit, which in turn means more flexible production and management. Since the production is not capital intensive and does not require elaborate housing and management know-how, children and young people find it interested and promising.

In the other hand, ages 41 and above years old recorded low number of producers across the study area with Mubi South having 64% while Hong had the least (19%).

b. Sex Distribution

The results showed that, males are the predominant producers of mini-livestock in the study area with Mubi South LGA recording the highest and lowest of 85% and 15% respectively as can be seen in Table 1. This could probably be that, males are responsible for family food production and income generation in Adamawa State, Nigeria. In addition, since mini-livestock production is suitable for backyard family production and can contribute to increased food security, men seized that opportunity to boost family income.

Table 1: Socio-Cultural Characteristic of Mini-Livestock Producers

Parameter	**Local Government Areas**													
a.Age	**MK**		**MN**		**MS**		**MH**		**HG**		**GB**		**GY**	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
10-40year	56	56	60	60	36	36	67	67	81	81	79	79	78	78
41-above	44	44	40	40	64	64	33	33	19	19	21	21	22	22
b.Sex														
Male	71	71	81	81	85	85	63	63	73	73	74	74	72	72
Female	29	29	91	91	15	15	37	37	27	27	26	26	28	28
c.Tribe														
Hausa/Fulan	6	6	25	25	29	29	14	14	39	39	18	18	10	10
Others tribe	94	94	75	75	71	71	86	86	61	61	82	82	90	90
d.Religion														
Christianity	82	82	80	80	46	46	46	46	83	83	71	71	88	88
Islam	18	18	20	20	54	54	54	54	17	17	29	29	12	12
e.Qualifica														
Pri/Sec/	94	94	97	97	81	81	62	62	63	63	99	99	100	100
Msc/PhD	6	6	3	3	19	19	38	38	37	37	1	1	0	0
f.Occupati														
Student	69	69	55	55	72	72	65	65	63	63	36	36	26	26

Civil/ser/Bu	31	31	45	45	28	28	35	35	37	37	64	64	74	74

Key: MK− Michika, MN− Mubi North, MS− Mubi South, MH− Maiha, HG− Hong, GB− Gombi, GY− Ganye, F− Frequency, %− Percentage

c. Tribe Distribution

The findings showed that, other tribes had the highest number of mini-livestock producers in Michika (94%), Maiha (86%) while Hausa/Fulani recorded the lowest of 6% and 14% in Michika and Maiha LGAs respectively as shown in Table 1.

This may be because other tribes keep mini-livestock to supplement the annual crops production in the study area. While Hausa/Fulani are traditionally known to produce cattle in addition to sheep and goats across the study area.

d. Religion Distribution

The results in Table 1 indicated that, Christians are the highest producers of mini-livestock in Ganye (88%) followed by Hong (83%) and Michika (82%). While Muslims are the least in Ganye (12%), Hong (17%) and Michika (18%) respectively. The results obtained could be associated to religion taboos of the people in the study area as production of some livestock are forbidden in Islam while Christianity allow some certain degree of freedom in food production and consumption.

e. Qualification Distribution

The findings showed that, people with primary school, diploma and first degree are the highest mini-livestock producers in Ganye (100%), Gombi (99%), Mubi North (97%) followed by Michika and Mubi South (94 and 81%). While other LGAs had 62 and 63% respectively. This may be since most of the producers are youths might have not yet attain higher qualification. It was observed that, people with masters and PhD have little or no time for such backyard production of mini-livestock. Some of them are engaged in more profit driven ventures than keep small animals.

f. Occupation Distribution

The results indicated that, non-students are the predominant producers of mini-livestock with Ganye having the highest of 74%. Amongst the student producers, Maiha had the highest with 72% while the least was recorded in Ganye (26%). Most students are assumed to be in school in some distant towns and cities as at the time of

data collection. Those schooling within the study sites may not have time raising mini-livestock because of academic activities. Civil servants and business men and women are the ones having time for mini-livestock production since is not a tedious work.

Common Species of Mini-Livestock Found in the Study Area

The results in Table 2 showed that, ten species of mini-livestock are commonly found in the study area with rabbits, pigeons, grasshoppers and honey bees most popular and reflected in all the seven LGAs of Adamawa State, Nigeria. Mubi North and Ganye had the highest number of mini-livestock species having 8 each, followed by Mubi South (7) while Michika and Maiha had 6 each. The least was from Hong and Gombi with 5 species each respectively. The results agree with Imoru and Babadipe (2019) who reported similar findings.

It was observed that, rabbits, pigeons and honey bees are the species produced for commercial and income generation ventures while the other ones like grass-cutters, guinea pigs, quails, snakes and tortoise are either kept as a pet or for research purposes. It was gathered that, grasshoppers are not actually produced but shipped from other states and distributed for consumption as snacks throughout the study area. Edible termites are mostly caught from the wild or within residential areas during rainy season especially in the nights with the aids of lights. They are processed for consumption by many families as additional source of protein and minerals.

Table 2: Species of Mini-Livestock in the Study Area

Species	**Mk**	**MN**	**MS**	**MH**	**HG**	**GB**	**GY**	
Vertebrate								
Rabbit	+	+	+	+	+	+	+	
Grasscutter	--	+	+	--	+	+	+	
Guinea pig	--	+	+	+	--	--	--	
Snake	+	+	+	+	--	--		+
Tortoise	+	--	--	--	--	--	+	
Pigeon	+	+	+	+	+	+	+	
Quail	--	+	--	--	--	--	--	
Invertebrate								
Termites	--	--	--	--	--	--	+	
Grasshopper	+	+	+	+	+	+	+	

Honey bee	+	+	+	+	+	+	+
Total	**6**	**8**	**7**	**6**	**5**	**5**	**8**

Common Species of Mini-Livestock Consumed in the Study Area

The results in Table 3 showed that, out of 13 common species of mini-livestock identified and consumed in the study area, 11 of them are eaten in almost all the local government areas except for lizards and crocodiles that are traditionally forbidden in 6 local government areas. In Michika, Higgi tribe in particular, traditionally, eating of lizard family such as alligators, monitor lizards and crocodiles is a taboo. People that eat those animals are referred to as makeri associating them with nasty habits and unwholesome consumption of unclean foods. The results also agree with that of Imoru and Babadipe (2019) who reported similar findings

In Gombi for instance, all the 13 animals are traditionally allowed and consumed by some few tribes. While 11 animals are consumed in Michika, Mubi North, Mubi South, Maiha and Hong local government areas. Whereas, 10 are commonly consumed in Ganye. For example, African giant snails are most consumed by Igbo people resident in all the local government areas surveyed. Likewise snakes are also consumed by some few tribes who probably think that, any flesh contains protein provided is handled well and of which religion allows it.

It was gathered that, any animal that lays eggs is wholesome and can be consumed even amongst the religious communities.

Table 3: Common Species of Mini-Livestock Consumed in the Study Area

Vertebrate	**Mk**	**MN**	**MS**	**MH**	**HG**	**GB**	**GY**
Rabbit	√	√	√	√	√	√	√
Grasscutter	√	√	√	√	√	√	√
Guinea pig	√	√	√	√	√	√	√
Snake	√			√			
		√	√		√	√	--
Lizard	-			-			
	-	--	--	-	--	√	--
Crocodile	-			-			
	-	--	--	-	--	√	--

Tortoise							
	√	√	√	√	√	√	√
Pigeon							
	√	√	√	√	√	√	√
Quail	√			√	√		
		√	√			√	√
Invertebrate							
African giant	√			√	√		
snail		√	√			√	√
Termites	√			√	√		
		√	√			√	√
Grasshopper							
	√	√	√	√	√	√	√
Honey bee							
	√	√	√	√	√	√	√
Total							
	11	**11**	**11**	**11**	**11**	**13**	**10**

Major Economic Benefit Driven from Mini-Livestock in the Study Area

The findings indicated that, about 7 major economic benefits are driven from the production of mini-livestock across the study area (Table 4). It was observed that, backyard production of mini-livestock is a major contributor of protein for both rural and urban dwellers since the animals are less expensive to buy. A family can eat the meat produced by most mini-livestock in one meal or in one day to minimize the risk of spoilage. It was also gathered that, mini-livestock if properly handled, can make a great contribution to increased food security because of its small scale, indigenous and flexible nature and because women and children are likely to be very much involved in the routine management of the animals. The results corroborated with that of Imoru and Babadipe (2019) who reported similar findings

The results showed that, increased productivity of mini-livestock tends to fit well into existing farming systems, thereby expanding the resource base and recycling nutrients and manure. Mini-livestock can be easily raised in urban settings that represent a possible option for urban farming which provides food and revenue/income for poor people.

It was observed that, mini-livestock production is also good for involvement of children and its characteristics make it ideal for use as a teaching aid or research in both primary, secondary schools, colleges and universities.

Table 4: Major Economic Benefit of Mini-Livestock in the Study Area

Benefits	**Mk**	**MN**	**MS**	**MH**	**HG**	**GB**	**GY**
Food/protein	√	√	√	√	√	√	√
Manure	√	√	√	√	√	√	√
Income/employment	√	√	√	√	√	√	√
Research	√	√	√	√	√	√	√
Raw materials	√	√	√	√	√	√	√
Foreign Exchange	√	√	√	√	√	√	√
Medicine	√	√	√	√	√	√	√
Total	**7**						
	7		**7**	**7**	**7**	**7**	**7**

It was observed that, many species have fur, skins, feathers, fats and other by-products that are used as raw materials, foreign exchange earnings, medicine, often more valuable than their meat, milk or eggs. Processing of by-products creates diversification for the farmers and perhaps jobs for the villagers, producers and government.

CONCLUSION

Mini-livestock is a sustainable form of animal production that has significant potential for further development. It should now be considered as a normal component of tropical livestock and rural development. It is very much associated with increased food security as it lends itself to small scale family production. There is now sufficient information on mini-livestock production to intensify extension, training and education programmes in order to promote it more widely. At the same time there is an urgent need to invest in further technical and systems research on mini-livestock production.

RECOMMENDATIONS

Based on the findings, the following recommendation was made;

i. Young people that have interest in mini-livestock production should be encouraged through provision of incentive and other necessary production facilities.
ii. Micro-livestock expertise should organize training and educate those who are into production and intended individuals on the best mini-livestock management practices.
iii. The government should sensitize the people living in the study area on the importance of mini-livestock management practice and benefits of keeping moderate household livestock for food security and standard of living.

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