ECONOMIC ANALYSIS OF CATTLE FATTENING IN MUBI NORTH AND SOUTH LOCAL GOVERNMENT AREAS OF ADAMAWA STATE, NIGERIA.

BY

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Agriculture plays an important role in the economic development of Nigeria. It provides food for the growing population, employment for over 65% of the population and raw materials as well as foreign exchange earnings for the development of the industrial sector (Alabi and Esobhawan, 2006). However, in more recent years, there has been marked decline in the performance of Nigerian agriculture. The contribution of Nigerian agriculture to the gross domestic product (GDP) which stood at an average of 56% in 1960-1964 declined to 47% in 1965-1969 and further declined to 35% in 2002-2004,(Amaza and Maurice,2005). The inadequate food security for a large proportion of the Nigerian population according to Defeor, *et al*, (2004), continues to exacerbate poverty and malnutrition.

The livestock sub-sector is an important component of Nigerian agricultural economy in terms of being both an economic enterprise and as an employment generating sector at the primary, secondary and tertiary levels. Using the 1984 factor based data; the sub-sector contributes on annual basis, a little over 5% of the gross domestic product (GDP) between 1996 and year 2000. In the case of its role in the Nigerian agricultural sector itself, the livestock sub sector is second only to the crop sub sector and represents on average over 13% of agriculture's contributions between the year 1999 and 2000. (Central Bank of Nigeria, 2000). In terms of the provision of the much needed meat to average Nigerian, the performance of the livestock sub sector has not been encouraging. For example from cattle, less than 2 kilograms of beef were available to an average Nigerian per year and just mere 13.2kilograms of egg per annum could be supplied locally to each Nigerian between the year 1996 and 2000 being the period under consideration (Okuneye, 2002)

The protein intake of average Nigerian is abysmally low due to poverty, for instance; the British Medical Association recommends a minimum animal protein intake of 34g per capita per day. Also, the food and agricultural organization (FAO) of the United Nation recommends 20g of animal protein per capita per day as the minimum for consumption for developing countries (Okuneye and Banwo, 1990), but 75g as optimum for normal growth and development (FAO, 1992). However, according to Olayemi *et al*, (1986), the average animal protein intake per capita per day in Nigeria was a mere 7.6kg that is 38% of the FAO minimum requirement for developing countries and mere 10% for excellent growth and development.

Cattle account for more than 50% of Nigerian total meat supply, and it is the largest livestock undertaken in Nigerian agricultural industry (Adamu, 1992). Oyenuga, (1982) puts the cattle population of Nigeria at 8-12 million, while Fricke (1993) estimated that of Adamawa State to be 1 million (about 9.2% of the nation's cattle stock).

Through recorded history, the consumption of meat has always indicated a position of social and economic well being and prestige. Thus, the level of meat consumption is often an indicator of the economic status of the state, country or an individual (Forest et- al, 1975). As noted by Pyke, (1978), the poorer the people are, the less satisfactory their diets tend to be and most obviously the less animal protein they contain.

1.2 Problem Statement

The demand for animal protein in Nigeria like in other developing countries of the world is far from being met (Okuneye 2002). According to Oyenuga, (1987) and Allison-Oguntateru, (1992) only 13.2g is obtained as against the recommended minimum rate of 35g of protein expected to come from meat product. According to Adebayo and Olayemi (2005), the expectation of farmers in Adamawa State is to own at least 89 livestock units (LSU) of cattle, earning of minimum total gross margin of ₦717, 039.00 per average farmer,

achievement of minimum milk production of 8,081 litres, ownership of a minimum of 29 small ruminant (about 3 LSU) and maximum variable production cost of ₦50, 000.00 per farmer.

There are quite a number of constraints facing cattle fattening, notable among are the socio-economic characteristics of the fatteners, cattle rustling theft, inefficient use of resources that is lack of proper guide on how to utilise these inputs and poor pricing policy (Ibrahim, 2007 and Anon., 2008). In view of the above therefore, it is important to carryout a research on economic analysis of cattle fattening to meet up with the demand of the teeming population in terms of meat needs. It is also important to find out the most efficient ways of using the scarce resources to maximise their profit at the long run. Similarly, it is vital to know the nature of cost and returns in cattle fattening as this would measure their profitability level. This research will also identify fattening problems and suggest possible solutions.

This research attempted to answer the following research questions;

i. What are the socio-economic characteristics of cattle fatteners in the study area?
ii. How profitable is cattle fattening in the study area?
iii. How efficient are fatteners using their resources in the study area?
iv. What are the problems faced by cattle fatteners in the study area?

1.3 Objectives of the Study

The broad objective of this study is to carryout an economic analysis of cattle fattening in Mubi North and South Local Government areas of Adamawa State, Nigeria. The specific objectives include to:

i. examine the socio-economic characteristics of cattle fatteners in the area,
ii. determine the cost and returns associated with cattle fattening in the study area,
iii. determine the resource use efficiency in cattle fattening, and

iv. identify the major constraints militating against cattle fattening in the study area.

1.4 Significance of the study

Cattle are the main source of protein and account for more than 50% of Nigerian total meat supply and the largest livestock industry in Nigeria (Adamu, 1992). Similarly, cattle have been reported as a source of traction, manure, food, industrial products and employment (FDLPCS, 1991).

In Adamawa State, economic activities depend highly on cattle marketing where government derive its revenue from direct taxes at cattle markets like that of Mubi, Song, Fufore and Ngurore (Ibrahim, 2007). Apart from revenue generation, people in the state also depend mostly on beef for meat as their source of protein, for ceremonies and festivals.

The need therefore to assess the performance of the cattle fatteners in Mubi area is obvious because of the continuous increase in the number of people in the fattening business, which may be connected with the presence of the International cattle market in the area. The study will go a long way in assisting the farmers in taking rational decision in order to maximize profit. It will also be useful to policy makers in government and private sectors as well as those who will like to carry out similar studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Origin and Distribution of Cattle

Cattle are widely distributed through out the world. The total world cattle population is estimated to be more than 1.4 billion head, with about 35% in Asia, 23% in South America, 17% in Africa, 12% in North and Central America, 10% in Europe, and 3% in Oceania. The leading countries of the world are in order; India, Brazil, China, the United States, Argentina and Sudan. Beef cattle used for breeding in the United States are estimated at about 34 million heads and the leading states are Texas, Missouri, Oklahoma, South Dakota, Nebraska, Kansas, Montana, Iowa, Colorado and California.

Dairy cattle in United States are estimated to number 9.2 million heads. The leading states are California, Minnesota, Texas, Idaho, New-Mexico Ohio and Iowa (Perry, 2007).

2.2 Cattle Domestication and Breeds

The domestication of cattle began some 8500 years ago in South Eastern Asia, a probable second centre of domestication (WFS, 2004). The world population as put by Ranjhan (2001) is one billion, two hundred and eighty eight million, six hundred thousand (1,288,600,000) heads. Of these, he postulated that more than one-third (1/3) are found in the tropics. Similarly in Nigeria context, the bigger and higher yielding breeds such as white Fulani, Sokoto Gudali, Red Bororo are found in the northern part while the smaller and low yielding breeds like Muturu and Ndama are typical of the Southern Nigeria.

According to Stephen (2008), identifiable cattle breeds through out the world number 277, with 33 generally classified as beef breeds, 18 as draft breeds, 39 as meat draft, 21 as dairy draft, 61 as meat dairy and 51 as dairy breeds, while 54 breeds are classified as general purpose breed. Most of these are quite limited in distribution and importance. No cattle are native to the North America continent only bison, or buffalo. Cattle used for draft purpose are usually oxen that are

castrated males at least two or three years old. In the United States today, there are four times as many beef cattle as dairy Cattle. Production of milk per dairy cow in United States more than double after 1930 and reached 12,147 pounds (3,510kg) in 1991. Else where in the new world, the vast pampas of Argentina as large as France-provide excellent condition for grazing of cattle through out the year without need for shelter. In Australia, cattle have always ranked second in importance among livestock after sheep.

Similarly, cattle are further classified according to beef type. In Britain, isles led the world in the development of the principal beef breeds, Herefords, Angus, beef shorthorns, and Galloway's all originated in either England or Scotland. Other breeds of greatest prominence today originated in India (Brahman), France (Charolais, Limousine, and Normandy), Switzerland (Simmental) and Africa (Afrikaner). The Hereford breed considered to be the first to be developed in England, probably descended from white- faced, red bodied cattle of Holland crossed with the smaller back Celtics that were native to England and especially to Herefordshire.

In Nigeria cattle is classified into the following breeds; white Fulani (Bunaji), Red Fulani (Rahaji), Adamawa Gudali, Sokoto gudali, Keteku gudali, Muturu and Ndama (FAO, 1980) and (FMA, 1981). Population of the indigenous cattle has been estimated to range from 8-12 million (Otchere and Vonkanfulani, 1987). This is made up of at least 10 dual purpose breeds. Most of the *Bos indicus* species are found in the Sudan and Northern Guinea Savannah zones and conjugated in Kano, Adamawa, Bauchi, Borno and Sokoto State. The *Bostarus muturu, ndama* and the hybrid keteku are found in the states of the forest and derived Savannah zones. Further; the *Bostarus species* are susceptible to trypanosome infection, prevalent in the forest belt, derived savannah and southern guinea savannah zones.

In Adamawa state, the major cattle breed is the Adamawa Gudali which is of mixed origin but mainly a cross breed between white Fulani and short horn

cattle. They are characterized by very variable coat colour, white black, red or pied. They also have short horns and height at wither (height from the highest point of the shoulder, somewhere around the hump) range between 110 and 125 cm. Normal weights at maturity ranges between 350-400kilograms but there could be marked seasonal variation. These cattle are found all over the state but generally in the hands of settled pastoralists under extensive management system. There is also Sokoto Gudali or Bokoloji which are medium to large in size with well developed cervical-thoracic hump and dew lap. They could be fairly compact and fleshy under good management. They are mainly of cream or white coat colour. These cattle types are mainly in the hands of the transhumance nomadic Fulbe Bororo (who move all over the state and those practicing intensive fattening management in the urban areas). Bunaji or Yakanji generally called white Fulani are also found in the state (Adebayo *et al*, 1999).

2.3 The Importance of Cattle to National Economy

The importance of cattle in the national economy cannot be over emphasised. According to Forest *et al,* (1975), the consumption of meat has always indicated a position of social and economic well-being and prestige. Thus the level of meat consumption is often an indicator of economic status of a state, country or an individual that is to say meat consumption depends on individuals' level of income. Cattle are also reported to be source of traction, manure, food, industrial products and employment (FDLPCS, 1991).This shows how important meat is in our society today. Corbis and Kevin, (2004) attested to the fact that cattle and calf marketing generate $8400 million annually in North Dakota, U.S.A.This shows the significance of cattle in the economy of the people of the united state of America considering its contribution in the national economy as stated above.

Livestock sub-sector is an important component of the Nigerian agricultural economy in terms of being both an economic enterprise and as an employment generating sector at the primary, secondary and tertiary level

(Afolabi, 2007). He further exposited on the importance of this sector in nation economy that, it contributes on annual basis, a little over 5% of the Gross Domestic Product (GDP) between 1996 and 2000. It has been reported also that livestock sub-sector ranked second in revenue generation which represents 13% of agricultural contributions to gross domestic product (Central Bank of Nigeria, 2000).

About 80% of Nigerian population are engaged in agriculture which provides employment, serves as a source of livelihood before the oil boom (Fricke, 1992). Kalla, (1998) also reported that about six million pastorals derive their means of livelihood solely from livestock production in Nigeria. He further asserted that Nigeria livestock has a capital value of about 40 million naira which represents 40% of the agricultural gross domestic product.

Cattle as reported by Worse *et al*, (1997), provide high proportion of protein in human diet. They also asserted that organic beef do not support chains of nutrients compositional differences in amount that would be functionally significant to humans. In the same vein, research work also shows that cattle fed on grass has higher level of vitamin A, E, omega-3 fatty acids and conjugated linoleic acid (Duckkett *et al*, 1993 and Smith *et al*, 2005).

According to Krailas (2008), cattle account for about 177,000kilograms of yearly domestic meat consumption in Thailand. He also reported that dairy cattle raise promotion was started in Thailand in 1961, and milk production increased rapidly during last few years.

2.4 Cattle Marketing in Nigeria

Marketing according to Nwokoye, (2000) is a process of planning and executing the conception, pricing, promotion and distribution of ideas, goods and services to create exchanges that satisfy individual and organizational objectives. It involves the provision of time, form, place and possession utilities to commodities.

The major structural features of livestock and grain market in Nigeria are lack of price information to buyers and sellers, high number of buyers and sellers, free entry conditions and low degree of price competition (Abu et-al, 1996, Okereke and Anthonio, 1998). These suggest that, our market need to be restructured and organized by increased production and efficient marketing of agricultural products.

The Maiduguri cattle market is one of the largest in the country and it serves as producing as well as transit market for livestock especially cattle (Balami *et al*, 1999).

2.4.1 Product Differentiation

According to Billa *et al*, (2005), cattle are differentiated by both sellers and buyers in Maiduguri cattle market in terms of age, breed, weight and sex. From the research they conducted in Maiduguri, cattle market, Borno State. They also reported that other physical features are examined such as eyes, ears and nose. These features are used to detect health status of animals.

The diseased animals are recognised by their red eyes, dropping ears and dried nose (which move frequently); while healthy animals have white eyes upward pointing ears and moist nose. They further asserted that, tagged nose is also a sign that the animal was well checked before arriving market; such animals they said are believed to have a fast growth rate.

2.4.2 Market Efficiency

Market efficiency as described by Enya and Oniah (2007) and Olukosi *et al*, (2007) is used to measure the performance of market system. It describes how well the process of marketing is performed to maximise profit. Similarly, according to Adegeye and Dittoh (1985), marketing efficiency can be defined as a movement of crops and livestock from the producers to consumers at the lowest cost consistent with provision of the service consumers' desire.

Economic efficiency is concerned with the maximization of output with minimum inputs (in monetary terms) in marketing. It is basically concerned with

how effectively price reflects the cost of moving output through the marketing system. In another perspective, economic efficiency implies that a firm and an industry are operating on the lowest cost basis feasible with techniques, skill and knowledge available and that the benefits of all possible economies are reflected in the prices and margins prevailing in the market. This economically efficient marketing system utilises the techniques of performing marketing jobs that are the most profitable (Kols and Uhl, 1985 and Olukosi *et al*, 2007).

The research conducted by Erhabor *et al*, (2007) on efficiency of beef marketing in Edo State Nigeria showed that the average total marketing margin per kg of beef is ₦175.81. This represents about 34.50% of the average total retail price which is relatively low compared with the average producer market share (65.50%). According to them, the high producer market share suggested that the producers were not exploited by the marketers. Similarly, Enya and Oniah (2007) also reported that the beef producers (butchers) did not sell the product only to the marketers (wholesalers and retailers) but also directly to consumers. The low marketing margin was also reported to be less complexity and short channel involved in beef marketing in Edo State, Nigeria. This agrees with the work of Andrew (1996), Ahmadu and Ilavbarhe (2008).

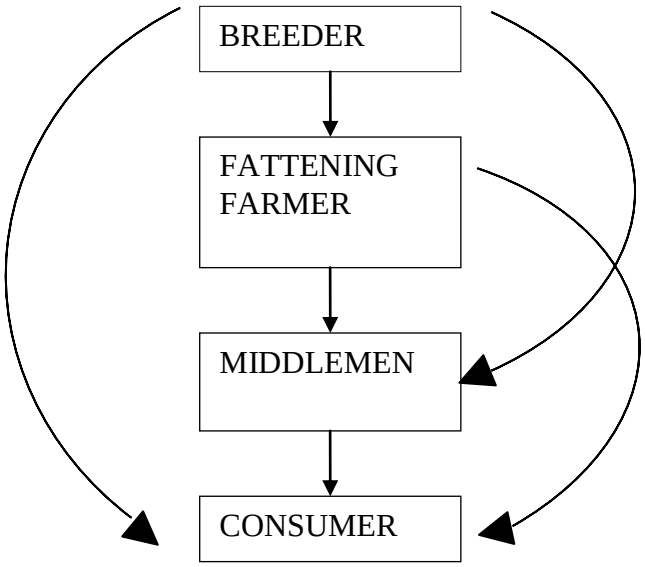
The average total profit (₦531.16) and average total marketing efficiency index 3.33 per kg of beef showed that beef marketing in the study area was profitable and economically efficient. The value of the efficiency index showed that every one naira spent on market activities yielded a profit of ₦3.33. The difference as reported by Erhabor *et al,* (2007) could be due to the lower average total marketing cost (₦30.47), higher average total marketing margin (₦186.84) per kg of beef in New Benin market and vice-versa in Oliha market (₦55.07, ₦162.54 and ₦107.47 respectively.

Differences in the efficiency between markets and also between middlemen suggested technical inefficiencies in the market system. These include poor storage, transportation and packaging facilities. Others are lack of processing

facilities and inadequate market information, which vary from markets and from time to time (Erhabor *et al*, 2007).

2:5 Cattle marketing channels in Adamawa State

Cattle marketing channels have been identified in Adamawa State. As shown in figure 1, there are four main channels namely: Breeder-Fattening Farmer- Middlemen -consumer, Breeder-Fattening Farmer-Consumer, Breeder-Middlemen --Consumer and Breeder-Consumer.



Source: Gabdo *et al*, 2005

Figure 1 Cattle Marketing channels in Adamawa State

2.5.1 Breeder- Fattening Farmer – Middlemen- Consumer (BFMC) channel

This is the longest of the marketing channel identified. It is a function of the number of fattening farmers and middlemen in the channel. The more the number, the higher the disposable price would be. Each participant is out for dividend hence selling price at the end may be at price floor leading to surplus. Boyes and Melvin (1996) attested that price floors are common features with agricultural products. This explains why the price of cattle finished product in the market is always high due to numbers of people involve in the movement of cattle from the breeder to the consumer.

2.5.2 Breeder – Fattening Farmer- Consumer (BFC) channel

Here the middlemen are off the link, depending on number of fattening farmer, but prices may still not be exploitive.

2.5.3 Breeder – Middlemen – Consumer (BMC) channel

This is a by pass to the fattening farmer; as the case may be selling price may be high or low. The presence of the middlemen brings about increase in prices of cattle in the market.

2.5.4 Breeder – Consumer (BC) channel

This is the shortest of the marketing channels. The selling price in this context may be price ceiling, leading to shortage because of non involvement of middlemen.

2.6 Profitability in Cattle Marketing

The Profitability of a particular business refers to the cost and returns where the total cost of production is deducted from the total revenue.

Mathematically:

$\Pi = P_y f(X_1 \text{----------} X_n + Z) - \sum P_i X_i$---------- ---------- (1)

Where Π= Profit.

P_y = unit price of output (₦)

$X_1, X_2 \ldots X_n$ = variable inputs,

Z = fixed inputs e.g. land.

$P_i x_i$= cost of variable inputs.

P_i=unit price of i^{th} variable input.

The major problems associated with cost and return analysis as the basis for profitability are:

i. It does not indicate the relative importance of each of the resources used in production.

ii. It is location bound and specific in applicability due to use of money as the common unit of measurement and prevailing price for estimates.

iii. In spite of the limitation, cost- return is a useful tool in determining profitability (Iheanacho, 2002 and Hassan, 2001).

2.7 Resource Use Efficiency

The concept of efficiency is concerned with the relative performance of the process used in transforming a given inputs into output (Mijindadi, 1981). In view of this therefore, efficiency can be divided into three; technical, allocative and economical efficiency. Technical efficiency focuses on physical productivity that occurs when larger quantity of output is consistently produced from inputs; allocative efficiency is concerned with choosing optimal combination of inputs. Therefore, a firm is allocatively efficient when production occurs at a point where the marginal value of product is equal to the marginal factor cost, while a firm economic efficiency on the other hand occurs when a firm chooses an enterprise in such a way as to attain economic optimum (Rahaman and Macaver, 2008).

Further, economic efficiency is a situation where there are both technical and allocative efficiency (Amaza *et a*l, 2001). The optimum implies that a given resources is being used efficiently as its marginal value product is just sufficient to offset its marginal cost (Adegeye and Dittoh, 1985).Thus efficiency is seen as a measure of the ratio of the marginal value product (MVP) to that of marginal factor cost (MFC).The marginal value product (MVP) is the addition to revenue as a result of a unit addition of output, while the marginal factor cost is the addition to cost as a result of using additional unit of input.

For a Cobb Douglas function, the marginal value product is the product of the regression coefficient of each input and the average physical product, where the marginal cost can be taken as either the market price purchased from a competitive input market or geometric mean values of the input cost, or depreciation of durable assets (Alimi, 2000).

Kay, (1986) stated that a firm maximises its profits if ratio of if it's MVP to its MFC is unity. He further stated that a ratio less than unity shows over utilisation of that resources and profit would be increased by decreasing the rate

of use of that input,. This will increase the level of profit of the firm. Onyenuga and Ukeagbu, (1987) also stated that the marginal returns are another measure of resources productivity. A ratio greater than unity indicates that the resources are under utilized. The optimum utilisation of resources occurs when the marginal returns to opportunity cost ratio is equal to unity.

From the results of marginal analysis of input utilization in a study carried out by Dama *et al,* (2000), feed was revealed to be over utilised, farm size, labour and durable assets were under utilized by poultry farmers. According to them, this shows that the farmers are inefficient in their production practices.

In another study by Amaza *et al*, (2001) on identification of factors that influence the technical efficiency of cotton farmers in Nigeria, they found that farmers' specific variables which comprises of status, education, farming experience and credit were significant factors that are associated with changes in the output of cotton.

However, at this point it should be noted that the operating production function of farm firm plays significant role relating to its efficiency. For instance, the production function presupposes technical efficiency from which the maximum output combinations could be derived (Amaza, 1999).

Nevertheless, apart from aspect of resource use efficiency, there are factors affecting cattle production even though specific problem may vary from one situation to another. In this vein, there are constraints facing both small and large cattle fatteners in Nigeria.

2.8 Problems of Cattle Fattening in Nigeria

Cattle fattening problems are obviously described in a lot of incidences. Okuneye (2002) pointed out that, there is high rate of spoilage of agricultural products including beef, arising from poor storage and transportation facilities there by hampering the total supply of food reaching the consumers table. This however has an indirect effect on cattle after fattening. Furthermore, he reported that there has been problem of price and sales volume fluctuation over the years

as a result of this marketing inefficiency. This led to loss of interest by the fatteners as the result in the failure in the fattening business.

As reported by Anon. (2008), insecurity in cattle fattening has been identified as a constraints in cattle fattening in Nigeria such as incident that happened in Ganye cattle market of Adamawa state where armed men broke into the market and killed nine (9) men and robbed many of them thousands of naira. In similar development, ABC Yola (2008) reported same incident of cattle rustling in some parts of Adamawa state where thieves threaten lives and properties of fatteners and marketers. In a study on the Economics of small scale cattle fattening in Adamawa central, Ibrahim (2007) reported that fluctuation in prices, high cost of feed, inaccessibility to credit facilities and ineffective extension service attribute to the main problems faced by cattle fatteners in Adamawa Central.

Stephen, (2008) reported the incidences of many disease and cattle pest as one of the major problem encountered by cattle fatteners in the world. He identified brucellosis as one of the major cattle disease. He attested that this disease produce undulant fever in humans through milk from infected cows. As a result of prevailing disease many cattle fatteners avoid such due to high risk involved. Furthermore, he re-iterated that beef production has become highly scientific and efficient because of high cost of labour, land, feed and high capital involved. He further asserted that, most brood cow herds, which require a minimum of housing pasture improvement and are typically found in relatively large areas and herds.

According to Gabdo *et al,* (2005), production inputs like feeds and water were found to be a problem in cattle fattening project and were in efficiently utilized via wastage which added up to production cost. They further pointed out that, loss or unprofitability in cattle fattening is due to ill estimation of production cost and lack of record keeping.

Problem recorded by Krailas (2008), against cattle fattening are the high cost of feeds and poor quality of feeds which subsequently led to low gain of weight.

CHAPTER THREE

METHODOLOGY

3.1 The Study Area

The study was carried out in Mubi North and South Local Government Areas, of Adamawa State.

Mubi region generally belongs to the highland relief region of Adamawa State. The region has a distinct relief configuration with series of mountain ranges lying along its eastern border with Cameroon. The elevation of the region above main sea level is generally high compared to other parts of Adamawa State. Elevation ranges from 400m to 550m (Adebayo, 1997 and Tukur, 1999).

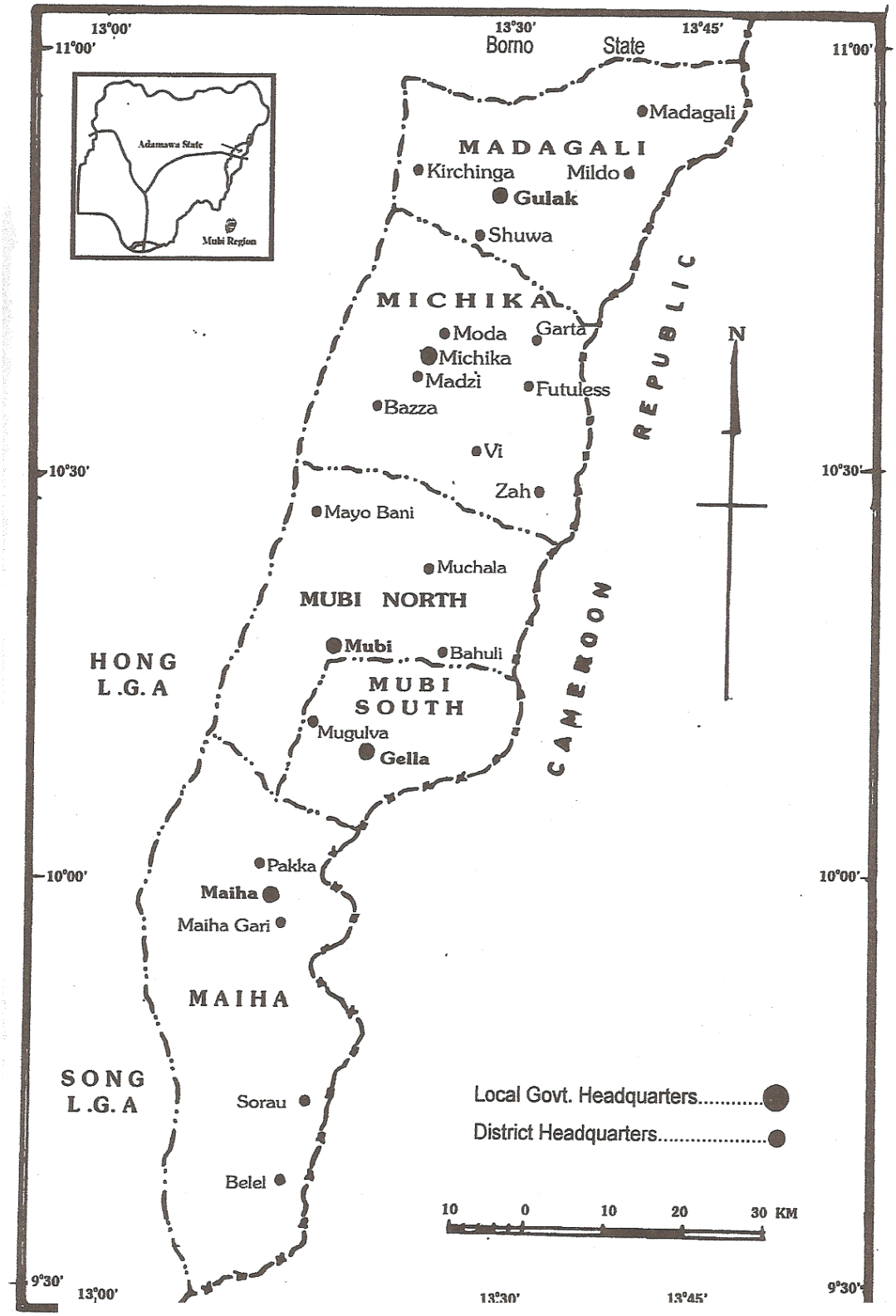
The temperature regime in Mubi region is warm to hot because of high radiation which is relatively and evenly distributed throughout the year. However, there is usually a slightly cool period between November and February (Ayoade, 1982).

Rainfall in Mubi region like any other parts of the county; is controlled by the movement of the Intertropical Discontinuity (ITD),the Months of May to September constitute the wet season in Mubi region. The mean annual rainfall pattern in Mubi region ranges from 900mm to 1050mm (Adebayo, 1997).

Mubi region consists of Five Local Government areas namely;

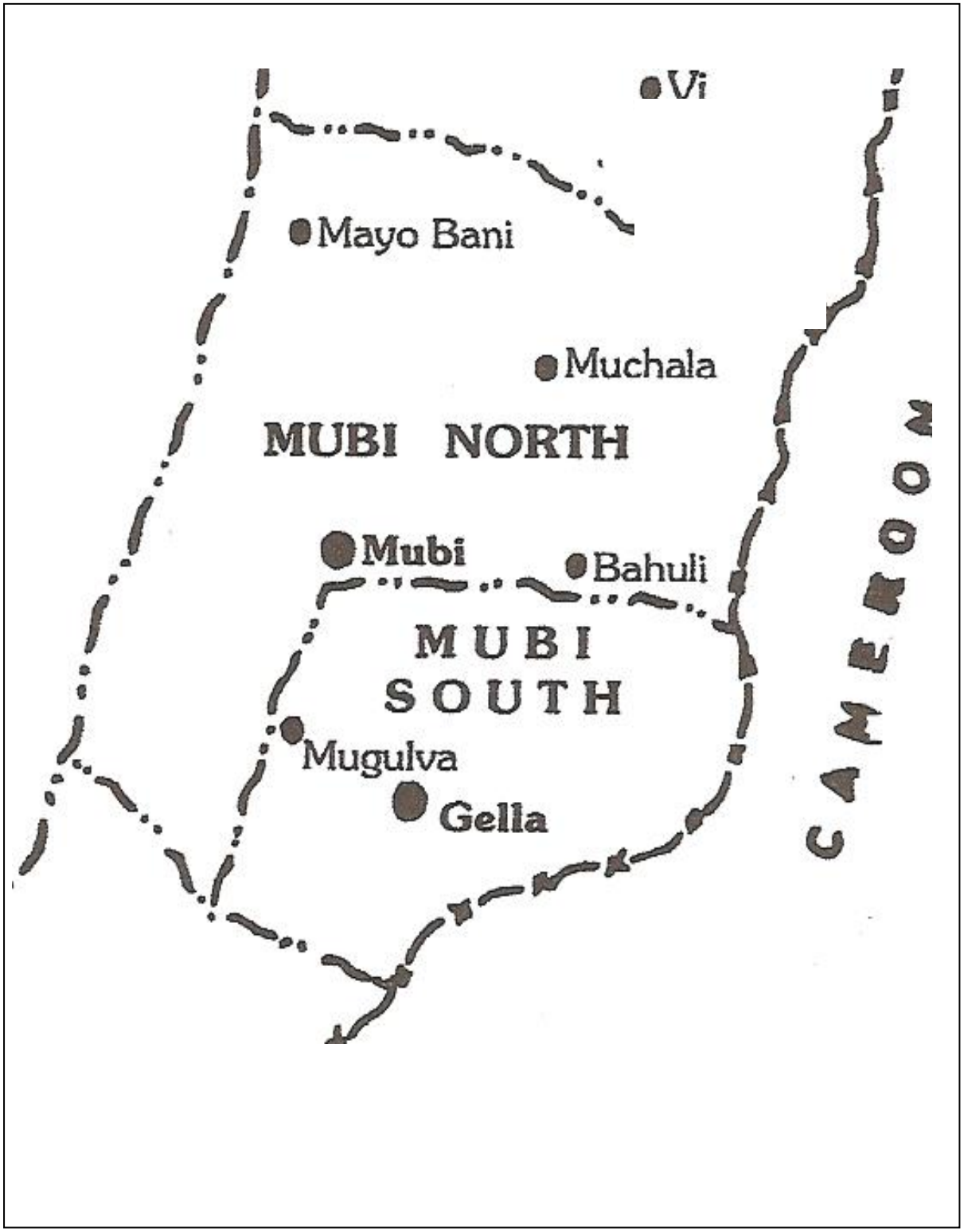
Madagali, Maiha, Michika, Mubi North and Mubi South. However, for the purpose of this study, Mubi North and South Local Government Areas were selected as the study area (Figure 3), due to its predominant involvement in cattle fattening.

Mubi region is further divided into 25 districts out of which only six (6) districts were selected for the purpose of this study because of its nearness to Mubi international cattle market. The selected districts are; Mubi Town, Fali, Ba'a, Mayo-Bani from Mubi North Local Government Area then Gude and Mugulvu also from Mubi South Local Government Area as shown in Table 1, (Adebayo, 2004).



Source: Adebayo, (2004).

Figure 2 Map showing Mubi Region



Source: Adebayo, (2004).

Figure 3 Map showing studying area

Table 3.1 Local Government Areas, Districts and their Headquarters showing Mubi region.

Local Government Areas.	Districts	Headquarters
Madagali	1. Madagali	Madagali
	2. Duhu	Duhu
	3. Kirchinga	Kirchinga
	4. Guluk	Gulak
	5. Mildu	Mildu
Maiha	1. Maiha	Maiha
	2. Belel	Belel
	3. Sarou	Sarou
	4. Mbilla	Mbilla
	5. Pakka	Pakka
Michika	1. Bazza	Bazza
	2. Madzi Watu	Madzi Watu
	3. Vi	Vi
	4. Michika	Michika
	5. Moda	Moda
	6. Garta	Garta
	7. Futu	Futuless
	8. Zah	Zah
Mubi North	1. Mubi	Mubi Town
	2. Fali	Muchalla
	3. Ba'a	Bahuli
	4. Mayo-Bani	Mayo-Bani
Mubi South	1. Gude	Gella
	2. Mugulvu	Mugulvu

Source: Adebayo, (2004).

3.2 Sources of Data collected

The data for this study were collected mainly from primary source. The primary data were derived by the use of structured questionnaires that were distributed to various cattle fatteners in the two selected local government areas (Table 3.2). Personal interviews and observations were also employed to ensure accurate results, while secondary data included information from textbooks, journals, statistical publication, thesis, internet, radio broadcast paper presentations and conference proceedings.

3.3 Sampling Techniques

Multi-stage, Purposive as well as snow- ball sampling techniques were used in the selection of the respondents. In the first stage, Adamawa North Senatorial zone was purposively selected out of Adamawa State. In the second stage, two local government areas were purposively selected (Mubi North &South). In the third stage, six districts were purposively selected out of twenty-five districts. Fourthly, twelve wards/villages were purposively selected and ten fatteners were selected by the use of snow-ball technique from each of the wards, this represented the sample frame of the cattle fatteners in the study area. Finally, a total of one hundred and twenty structured respondents were randomly selected to respondents across Muchalla, Kirya, Muva, Mayo-bani, Vimtim, Bahuli, Nassrawo, Lamurde, Bajaule, Muda, Lokuwa and Wuro- Gude respectively. At the end a total of one hundred and three (103) questionnaires were correctly completed out of One hundred and Twenty (120) distributed and used for the analysis (Table 3.2).

Table 3.2 Distribution of Respondents in the study area

LGAs	Districts	Wards	Selected Wards	No. Respondents	No.of questionnaires Received
Mubi- North	4	11	8	80	72
Mubi-South	2	10	4	40	31
Total	6	21	12	120	103

Source: Field Survey Data, 2010.

3.4 Methods of Data Analysis

The study employed the use of both descriptive and inferential statistics. The following were the analytical tools employed for the study:

3.4.1 Simple descriptive statistics

This was used to describe the socio-economic characteristics of cattle fatteners in the study area. These include the use of frequency counts, means and percentages to achieve objective one. Conclusions were arrived at based on the respondents' responses in simple percentage.

3.4.2 Arithmatic Mean Analysis

Arimthmatic mean from continuous frequency distribution (Grouped) is given as:

$$\xi = \sum fm / \sum f \quad \text{..... (2)}$$

Where; ξ=Mean

$\sum fm$=summission of frequency and mean of each class interval

m= mean of class interval

f=frequqncy of each class interval. (Obasohan et-al, 2005).

3.4.3 Gross- Margin analysis

This technique was used to analyse the net income of cattle fatteners at the end of the study period and this was used to achieve objective two.

$$GM = GI - TVC \quad \text{..... (3)}$$

Where:

GM = Gross margin

GI = Gross income

TVC = Total variable cost

NFI=GM-FC…… (4)

Where: NFI=Net farm income.

GM=gross margin.

FC=Fixed costs (rake, wheelbarrow, shovels, water cans, jar cans and feeding cans).

3.4.3 Benefit Cost Ratio (BCR) Analysis

Benefit Cost Ratio is the ratio obtained when the present worth of the benefit stream is divided by the present worth of the cost stream.

BCR=∑discounted revenue/∑discounted cost…… (5)

3.4.4 Gross Ratio (GR) Analysis

Gross Ratio is the total farm expenses (TFE) divided by the gross income (0lukosi et al, 1988).

GR=TFE/ GI..... (6)

Where; GR=Gross Revenue

TFE=Total Farm Expenses

GI=Gross Income

3.4.4 Multiple Regression Model

Multiple Regression Model was used to determine the effect or significance of each independent variable on the weight (kg) of cattle at the end of the fattening cycle and the results were used to achieve objective 3. The general form of the regression model is,

$Y= f(X_1, X_2, X_{3-}, \text{------} X_7)$ ---------- (7)

Four functional forms were tried to select the one with the best fit. These include,

(a) Linear function

$Y =b_{0+} b_1X_1+ b_2X_2 + b_3X_3 +\text{…….} +b_6X_6+ b_7X_7 +U_i$..... (8)

(b) Exponential function

$LnY=b_0+b_1X_1+b_2X_2+$..................$b_7x_7+U_i$.. (9)

(c) Semi-logarithm function

$Y=Lnb_0+b_1LnX_1+b_2LnX_2+$.........$b_7LnX_7+U_i$................................. (10)

(d) Double- log function

$LogY=logb_0+b_1LogX_1+b_2LogX_2+\ldots b_7LogX_7+Ui$................. .... (11)

Where;

Y = Final Weight of cattle after fattening (kg)

X_1 =Quantity of feeds used (kg)

$X_{2=}$ Volume of Water used (litres)

X_3 =Medication (Vials)

X_4 = Fatteners Experience (years)

X_5= Length of fattening (Weeks)

X_6 = Labour Man-day (hours)

X_7= Initial weight of cattle (kg)

b_0 = Constant or (coefficients)

$b_1 \ldots b_7$ = Parameters to be estimated

U_i = Error term

3.4.5 Marginal Analysis of Resource Utilisation

This tool was used to determine resource use efficiency of some of the inputs used by the farmers. This was calculated using the formula

$$r = \frac{MVP}{MFC} \quad \ldots\ldots \quad (12)$$

Where *r* = is the ratio of the resource use efficiency,

MVP = is the marginal value products and

MFC = is the marginal factor cost of inputs (unit price of inputs)

From estimated regression result of best fit production function equation, (Exponential production function) the values of MPP and MVP for the resources were obtained for use and calculated as follows:

MPP_{xi} = dlny/dx=1/yxdy/dx= b< .... (13)

$MVP_{xi} = MPP_{xi} \times P_y$.. *(14)*

Where: MPP_{xi} = marginal physical product of input x_i

MVP_{xi} = marginal value of input X_i

$\bar{x}_i$ = arithmetic mean value of input under consideration

$\bar{y}_i$ = arithmetic mean value of output

Py=unit price of the output.

Conclusions were arrived at using the following;
When:

$\frac{MVP}{MFC} = 1$ Shows that the resource is efficiently utilized in the production. This is the best point to maximize profit.

$\frac{MVP}{MFC} < 1$ Shows over utilisation of that resource and profit will be increased by decreasing the quantity used of that input.

$\frac{MVP}{MFC} > 1$ Indicates under utilisation of that resource and increasing the rate of use of that input will increase the level of profit.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Socio-economic characteristics of respondents.

The socio economic characteristics of cattle fatteners in the study area such as; Age, Gender, Marital status, Educational level, Occupations, Household size, Experience in years are presented and discussed below:

4.1.1 Age of Respondents.

As revealed in Table 4.1, about 79% of the respondents are within the ages of 20-49 years and above 20% are aged 40 years and above. This shows that majority are still young and agile. This gives cattle fattening in the study area a good prospects since the majority of the fatteners are youths. However, ages within 40-49 years lead cattle fattening in the study area and this could be as a result of the capital requirement as observed by Ibrahim (2005) that cattle fattening is mostly practiced by people of middle age class. In a similar research, Gabdo et-al, (2004) also reported that farmers at the age of 31 and 45 participate most in cattle fattening and people at age of 60 are less involved due to labour intensity.The mean age of the respondents was calculated be Fouty-Seven years, meaning that majority of the farmers are still active, hence the prospects of cattle fattening in the study are.

Table 4.1 Age Distribution of Respondents

Age (years)	Frequency	Percentages (%)
20-29	22	21.32
30-39	21	20.41
40-49	39	37.76
50-59	17	16.48
60-69	4	3.93
Total	103	100.00

Source: Field Survey, 2010.

Mean Age=47years.

4.1.2 Gender Distribution of Respondents

The gender distribution of the respondents in Table 4.2 below shows that majority (about 83%) of them are male while only about 18% are female. It was revealed that men struggle in order to maintain and provide for their family needs and the only means of doing this is by looking for an alternative job to bridge the gap and support their existing jobs. Labour involvement and high capital requirement for efficient and profitable cattle fattening may also contribute to less participation of female gender in cattle fattening in the study area.

Table 4.2 Gender distribution of the Respondents

Gender	Frequency	Percentages (%)
Male	89	82.46
Female	18	17.54
Total	103	100.00

Source: Field Survey, 2010.

4.1.3 Marital Status of Respondents

The marital status of the fatteners in the study area showed that 64% were married, above 20% were single and about 18% constitute divorced and 7% widow/widower (Table 4.3). The preponderance of married class was discovered to be associated with the nature of their large family size; hence the need for the choice of such venture this was supported by Gabdo, et-al. (2004) whom in their study revealed that married men and women struggled harder in order to maintain their families' status-quo unlike the unmarried once.

Tale 4.3 Marital status of Respondents

Marrital Status	Frequency	Percentages (%)
Married	64	62.10
Single	21	20.40
Divorced	11	10.70
Widow/widower	7	6.80
Total	103	100.00

Source: Field Survey, 2010.

4.1.4. Fatteners Experience in Years.

The distribution according to fatteners experience (Table 4.4) revealed that about 48% of the respondents have been into cattle fattening for 1-5 years which formed the majority, those fatteners who had 6-10 years of fattening experience accounted for about 20% and only 1% of the cattle fatteners in the study area were revealed to have fattening experience of 21 years and above. It can be deduced from the result therefore, that cattle fattening in the study area has not been in practice for a long period, this also revealed that the success of cattle fattening in the study area is not wholly dependant on experience of the farmer.

Table 4.4 Fattening Experience of Respondents

Experience (years)	Frequency	Percentages (%)
1-5	49	47.56
6-10	21	20.33
11-15	18	17.54
16-20	14	13.60
21-25	1	0.97
Total	103	100.00

Source: Field Survey, 2010.

Mean = 8(yrs)

4.1.5 Occupatinal Types of Respondents

Based on occupational distribution of respondents in Table 4.5, about 19% of the fatteners practiced one occupation, 82% practiced two occupations which could be the reason for better fattening business in the study area as this occupational combination brought about cheaper and easier access to feeds and better generation of capital for the business in the study area.It was also revealed in the study that farmers practicing only fattening is less because people can not depend on fattening alone but as another means of additional income for the family.

Table 4.5 Occupational types

Occupatinal Type	Frequency	Percentages (%)
Fattening	19	18.45
Fattening/ trading	15	14.56
Fattening/crop farming	35	34.93
Fattening/civil servant	34	33.00
Total	103	100.00

Source: Field Survey, 2010.

4.1.6 Household Size

As for the family size of the respondents (Table 4.6), about 50% had 1-5 members in their families, 32% had 6-10 and about 9% had 16 and above household members. This picture depicts to us that about 68% of the total respondents in the study area have 6-16 household members, thus the need for extra job such as fattening venture to maintain such growing population in the study area.

Table 4.6 House hold size of Respondents

Household Size	Frequency	Percentages (%)
1-5	51	49.50
6-10	33	32.00
10-15	10	9.80
16 20	9	8.70
Total	103	100.00

Source: Field Survey, 2010.

Mean =7people

4.1.7 Educational Level

Educational levels of respondents in Table 4.7 showed that more than 70% of the total respondents are educated with either primary, secondary or tertiary educational level, where as only about 25% of the respondents were revealed to have no formal education.This result revealed that education is paramount in cattle fattening and is in corroboration with the work of Gabdo, *et al* (2004) who in their research work on the Semi-Intensive Beef Fattening revealed that about 50% of their respondents had either primary or secondary education.

Table 4.7 Educational level of Respondents

Educational Level	Frequency	Percentages (%)
Non formal	26	25.20
Primary School	35	34.00
Secondary School	25	24.30
Tertiary institution	17	16.50
Total	103	100.00

Source: Field Survey, 2010.

4.1.8. Labour Types.

Table 4.8 shows that about 98% of the respondents used family labour and below 1% used hired labour and below 1% also used both cattle fattening process

in the study area. This explained the reason for low cost of labour in cattle fattening project in the study area. This means that family labour is very important for cattle fattening in the study area.

Table 4.8 Type of Labour used by Respondents

Labour Type	Frequency	Percentages (%)
Hired labour	1	0.97
Family labour	101	98.00
Both	1	0.97
Total	103	100.00

Source: Field Survey, 2010.

4.1.9 Sourcer of Water

Water sources distribution (Table 4.9) in the study area showed that 70% of the respondents obtained their water from wells about 30% of the respondents got theirs from other sources which included; pipe-bone (1.90%), water from vendors (12.60%) and streams (15.60%). This result means that majority (about 70%) obtained their water from well and this makes the water more readily for cattle fattening considering its importance in cattle fattening which in a long run reduce cost.

Table 4.9 Sources of Water

Source of Water	Frequency	Percentages (%)
Well water	72	69.90
Pipe bone water	2	1.90
Water from vendors	13	12.60
Others	16	15.60
Total	103	100.00

Source: Field Survey, 2010

4.1.10 Access to Medication

From (Table 4.10), acess to medication by the respondents shows that about 82% have access and about 19% claimed not to have access. The above results showed that those cattle fatteners in the study area responded positively to medical advice and this had a positive significance on the overall performance of cattle fattening process in the study area.

Table 4.10 Access to medication

Access to Medication	Frequency	Percentages (%)
Yes	84	81.50
No	19	18.50
Total	103	100.00

Source: Field Survey, 2010.

4.1.11 Access to Extension

From Table 4.11 only about 9% of the respondents had access to extension services while the majority (above 91%) did not benefit at all. This therefore shows that cattle fattening in study area does not depend on extension services but on other factors such as capital, experience, and accessibility to other variable inputs. Farmers in the study area depend solely on individuals' advice and personal initiatives and not on extension services.

Table 4.11 Access to extension workers

Access to extension service	Frequency	Percentages (%)
Yes	9	8.70
No	94	91.30
Total	103	100.00

Source: Field Survey, 2010.

4.1.12 Cattle Type

Cattle type (Table 4.12) revealed that more than 59% of the respondents fattened both bull and cow; about 4% and 17% fattened bull and cow respectively. However, the above result revealed that more farmers prefer to

fatten bull (24.29%) instead of cow (17.03%), because farmers in the study area revealed that bull consume less feeds and yet put up weight, whereas cow eat up more feeds and does not put up weight within a short period.

Table 4.12 Cattle type fattened.

Cattle Type	Frequency	Percentages (%)
Bull	75	24.29
Cow	53	17.03
Both	186	58.68
Total	317	100.00

Source: Field Survey, 2010.

4.1.13 Cattle Breed Fattenened

Cattle breed distribution revealed that Red Mbororo formed the major breed of about 75% fattened in the study area, while White Fulani of about 10% and Adamawa Gudali with about 15% also exist .This result is in consonance with the work of Billa and Bulama (2004) in their research on cattle marketing in Borno State, Nigeria whose result revealed that Red Mbororo cattle breed is mostly demanded in Maiduguri cattle market due to their fast response to fattening process and their quality skin and appreciable colour.

Table 4.13 Cattle Breed Fattened

Breed	Frequency	Percentages (%)
Adamawa Gudali	48	15.14
White Fulani	32	10.09
Red Mbororo	237	74.77
Total	317	100.00

Source: Field Survey, 2010

4.1.14 Sources of Cattle

Table 4.14 shows Cattle source distribution which revealed that about 58% of the cattle fattened in the study area were obtained from Cattle market as a result of its nearness to International Cattle market in Mubi town and more than

41% of cattle fattened in the study area were obtained from both cattle market and cattle herders.

Table 4.14 Sources of cattle

Cattle Source	Frequency	Percentages (%)
Cattle Market	60	58.25
Cattle Herders	40	38.83
Both	3	2.91
Total	103	100.00

Source: Field Survey, 2010.

4.2 Costs and Returns of Cattle Fattening

Table 4.15, shows that the estimated average net income per farmer is ₦123, 918.85 at the time of the study. Cost of feeds accounted for about 7% of the total variable costs. The high cost of feed was as a result of the system of animal husbandry (intensive system) practiced as this necessitated for continuous purchase of feeds through out the fattening cycle.

It was also discovered that the feeds were scarce as at the time of this research being dry season, hence the high cost of feeds in the study area.

The cost of water, medication, labour and transportation accounted for about 3%, 1%, 0.1% and 0.8% respectively. Well water (Table 4.9) was predominantly used by the cattle fatteners in the study area hence the moderate cost of water, low cost of medication in the study area during the fattening process was credited to lack of disease outbreak and strict compliance to instructions regarding cattle fattening processes as they are fattened intensively. The type of labour used in the study area was mostly family labour (Table 4.8) and this made it possible for the fatteners to spend less on labour since they have family size who are capable of providing the required man-day hours. Mubi Township hence less cost of transportation was incurred by the farmers.

The average net income per farmer was estimated to be ₦39,976.22, this revealed that cattle fattening in the study area is highly profitable, this result is not in corroboration with work of Gabdo et-al, (2004) who in their study on the Econometrics Analysis of Semi-intensive Beef Fattening in Adamawa State discovered that cattle fattening project is unprofitable venture and that of Jirgi and Tanko,(2009) who also in their study on the Economics of Small-Scale Goat production revealed that the profitability in this business is low compared to that of cattle fattening in the study area. The benefit cost ratio was 0.73 that was per naira invested ratio on each cattle and the estimated gross ratio was 0.74. This result indicated increasing to scale.

Table 4.15 Total costs and returns for fattening Three Hundred and Seventeen (317) Cattle in the study area

Inputs	cost (₦)	%value
Variables		
Cattle	15,151,900.00	87.66
Feeds	1,266,090.00	7.32
Water	530,167.00	3.07
Medication	181,421.00	1.05
Labour	8,000.00	0.5
Transportation	137,250.00	0.79
Total variable cost	17,284828.00	
Cost of depreciated fixed Assets	91,180.00	
Total cost of fattening	17,376,008.00	
Returns		
Output Gross Revenue	30,139,650.00	
Gross margin	12,763,642.00	
Average Gross margin/farmer	123,918.85	
Net Income	12,672,462.00	
Average Net Income/farmer	39,976.22	
Benefit Cost Ratio (BCR)	0.73	
Gross Ratio (GR)	0.74	

Source: Field Survey, 2010.

4.3 Average costs and return per Cattle

Table 4.16 indicates average costs and return in cattle fattening in the study area which revealed that about ₦54,813.90 as the average cost encured in fattening each of the cattle and the average return per each cattle was estimated to be ₦95,077.76 where as the average net income/cattle is ₦39,976.22. This revealed that there was high profitability in cattle fattening in the study area. However, costs of medication and transportation per cattle were revealed to be observably higher than the other inputs which invariably suggest that farmers in the study area should be thoughtful how they spend on such inputs to maximize profit.

Table 4.16 Average costs and returns/cattle

Inputs	Cost (₦)
Variable	
Cattle/head	47,797.79
Feed/kg	2.88
Water/litre	2.35
Medication/vial	516.87
Labour man-day/hour	11.38
Transportation/ cattle	432.96
Average depreciation	287.63
Average cost/cattle	54,813.90
Average return/cattle	39,976.22
Average net income/cattle	46, 025.90

Source: Field Survey, 2010.

4.4 Production function analysis

4.4.1 Input-output relationship

From the results in Table 4.17 of the exponential production function gave the best fit because it showed minimum standard error (0.18349), R^2 is 67% and four variable inputs indicated high level of significant and hence the reason for its choice as the lead equation. The selection of the lead equation was also based on the econometric, economics and statistical analysis of the input-output relationships. The lead equation is written thus;

$$LnY=2.525+ 3.841E\text{-}5X_1+6.047E\text{-}6X_2+0.009X_3+0.010X_4-$$
$$(17.891)^{***}\ (2.071)^{**}\quad (0.126)\qquad (1.429)^{*}\quad (2.820)^{***}$$
$$0.002X_5+0.010X_6+0.701X_7$$
$$(-0.167)\qquad (0.572)\qquad (11.111)^{***}$$

All figures in parenthesis are t-values.

R^2=67.10%

F-ratio= $(27.645)^{***}$

Standard error=0.18349.

The result below shows that water is statistically significant at five percent (0.05) level of significance; medication is statistically significant at one percent (0.01) level of significant in the input-output relationship. Whereas, and farmers experience is statistically significant at ten percent (0.10), initial weight is also revealed to be statistically significant at ten percent (0.10).On the contrary, feeds and labour were revealed to be statistically insignificant in the input-output relationship but they are positive. The length of fattening was revealed to show a negative effect on the output. The negativity in this case implies that the longer a farmer keeps cattle under fattening the more cost, hence less profit at the long run. It was also revealed that cattle kept longer than necessary tend to loss weight and this may be as a result of loss of appetite and climatic changers which is not favourable to cattle under fattening. All these will result to farmers' loss in cattle venture.

The result also revealed that the influence of one percentage (0.01) increase in farmers experience and initial weight resulted in 0.010kg and 0.701kg increase in the final weight of cattle. While the influence of five percentage (0.05) increases in water resulted in 0.525kg of the final weight of the cattle and ten

percentage (0.10) increase of medication was revealed to have a total influence of 0.09kg in the final weight of the cattle. This result agrees with that of Jungur, et-al (2009) and Gabdor, et-al (2004) who in their study on Profitability Analysis and Management Practices among Poultry Farmers and Econometrics Analysis of Semi-Intensive Beef Fattening revealed that inputs such as medication, farmers' experience and water were statistically significant in input-output relationship.

Similarly, the result also revealed that the coefficient of determination R^2 is 0.671.This implies that 67% of the final output (dependent variable) is explained by the inputs (independent variables), and the F-ratio is 27.645 indicating a five percent (5%) level of significant.

The analysis of Beta coefficients put the independent variables in decreasing order of importance as follows;farmers experience (0.010), labour (0.010),medication (0.009),initialweight (3.841E-5),feeds, (6.074E-6) and length of fattening (-0.002).This order of importance explains the degree of significance of each independent variables on the final weight based on the economic, econometric and statistical analysis of input-output relationship.

Table 4.17 Results of Regression Analysis for Estimated Cattle Fattening.

Variable	Linear	Exponential	Double-log	Semi-log
Constant	-366.262 (0.811)	2.525 (17.891) ***	0.870 (2.312) **	-5423.366 (-2.972)
Water	0.105 (1.770)**	3.841E-5 (2.071) **	0.092 (1.024)	90.874 (0.208)
Feeds	0.001 (0.006)	6.074E-6 (0.126)	-0.022 (-o.416)	-26.892 (-0.103)
Medication Service	27.074 (1.288)*	0.009 (1.429)*	0.002 (0.134)	-51.990 (-0.696)
Farmers Experience	24.588 (2.158) **	0.010 (2.820) ***	-0.053 (1.237)	52.231 (0.251)
Length of Fattening	13.620 (0.447)	-0.002 (-0.167)	0.073 (0.587)	496.062 (0.822)
Family labour	8.681 (0.151)	0.010 (0.572)	-0.021 (-0.074)	-565.322 (-0.417)
Initial weight	1.159 (16.528)***	0.701 (11.111) ***	0.636 (9.542) ***	321.779 (7.186) ***
R^2	0.793	0.671	0.590	0411
F-ratio	52.129	27.645	19.563	9.470
Standard error	587.52933	0.18349	0.20465	992.11189

Source: Field Survey, 2010.

***=Significant at 0.01 level of probability
** = Significant at 0.05 level of probability
* = Significant at 0.10 level of probability

4.4 Resource Use- efficiency

The marginal physical products (MPPs) of variable inputs used in cattle fattening were determined using the arithmetic mean values of output and inputs and the marginal value product (MVP) for each input was calculated as a product of its marginal physical product and unit price of output. Table 4.18 presents marginal physical products (MPP), marginal value products (MVP), marginal factor cost (MFC) and the ratio of marginal value product to marginal factor cost(r). These figures were calculated from the estimated regression coefficients of some selected independent variables. The marginal value productivity of resources formed the yardstick for measuring the resource use efficiency at a given level of technology and also provided a framework for policy decision on resource adjustment.

The analysis revealed that marginal value product (MVP) for medication services was 169,189.83 vials which implied that all things being equal, increasing the number of vials will increase the healthy status and subsequently the weight of fattened cattle by169,189.83 kilograms at the end of fattening period. The ratio of marginal value product to marginal factor cost was estimated at 327.33; hence the medication service was below the economic optimal level that is the ratio is above unity. This also implies that the resource (medication service) was under-utilized. Similarly, water was under-utilized with ratio of its marginal value product to marginal factor costs as 306.68.This result also revealed that ratio is above unity and by implication the resource is under-utilized. However, feeds were revealed to be over-utilized with a ratio of marginal value product to marginal factor cost (0.04) of less than unity.

From the results of resources use efficiency, more of medication and water are recommended to farmers in the study area while less use of feeds for the fattening cycle is commended for higher output in weight and maximum profit utilization. Therefore, for optimum resource utilization, more of medication and water should be used and the use of feeds should be minimized by the farmers in the study area in order to maximize profit.

Table 4.18 Estimated marginal physical products, marginal value Products and resource use efficiency

Inputs	MPP	MVP	MFC	r=MVP/MFC
Medication	3.5397	1691.83	516.86	327.38
Water	0.0150	721.87	2.35	306.68
Feeds	0.0237	1136.76	28988.89	0.04

Source: Field Survey, 2010.

Unit price of output (PY) =₦ 49,354.72

4.5 Problem of Cattle fattening the study area.

Analysis of problems faced by the farmers in the study area revealed that about 23% of them reported lack of encouragement from the government, above 22% complained of poor pricing policy as a threat to the business while 16% complained that high cost of medication affects their fattening venture. Notably, about 21% reported high costs of feeds as a problem in cattle fattening in the study area. Some of them (about11%) were of the opinion that disease outbreak has been a threat to the cattle. Other problems mentioned among the farmers are poor security as reported by more than 6% and high cost of labour as asserted by about 2% farmers.

Lack of encouragement by the government, poor pricing policy and high cost of feeds constituted the major problems to cattle fattening in the study area. Inability of fatteners to have access to extension service as a link between farmers and Government resulted to inability to have support in terms of loans and good skills. High cost of feeds was revealed to be as a result of the nature of fattening process being an intensive project that requires regular demand for feeds.Seasonl availability of feeds may also be the cause of high cost of feeds in the study area.

Similarly, the reason for poor pricing policy could be attributed to absence of standard means of measurement of weight of cattle and the activities of the numerous middlemen involved in cattle marketing.Instability of price of cattle in

the market could also be as a result of high demand for cattle during festivities and ceremonies such as Christmas's and sallah celebrations in the study area.

Poor security and risk in the area are attributed to its nearness to the boarder of the Republic of Cameroon where cattle rustlers easily come in as revealed by most respondents in the study area.

Table 4.19 Problems affecting cattle fattening

Problems	Frequency	Percentages (%)
Lack of encouragements by Government	92	23.23
Poor pricing policy	89	22.47
High costs of feeds	85	21.45
High cost of medication	64	16.16
Disease outbreak	43	10.86
Ignorance	41	10.35
High cost of transport	32	8.08
Poor security	27	6.82
High cost of family labour	7	1.77
Others	1	0.25
Total	396	100.00

Source: Field Survey data, 2010.

*Multiple responses.

4.6. Farmers Recomendations

Table 4.20 shows recommendations from farmers' point of view that can improve cattle fattening in the study area. About 21% of the farmers suggested adequate access to loan and credit facilities, above 19% recommended efficiency of extension services and about 19% also recommended access to adequate medication services, while about 17%,16% and 8% recommended good market and pricing policy, adequate feeds and good security network respectively. They reported that if these are given prompt attention there would be great improvement in cattle fattening in the study area and the nation at large.

Table 4.20 Recommendations based on farmers' views

Reccommendations	Frequency	Percentages (%)
Access to loans	69	21.04
Efficient extension services	64	19.54
Access to medication services	63	19.21
Good market & pricing policy	55	16.77
Adequate water and feeds	51	15.55
Good security network	26	7.93
Total	328	100.00

Source: Field Survey, 2010.

*Multiple responses.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

This study investigated the Economic Analysis of Cattle Fattening in Mubi-North and South Local Government Areas of Adamawa State. The study employed the simple descriptive statistics, gross margin analysze, multiple regression analysis and marginal analysis of input utilization to analyse the socio-economic characteristics of the cattle fatteners, costs and returns in cattle fattening, inputs-output relationships in cattle fattening process and to determine the efficiency of resources used respectively.

The study revealed that men dominated the cattle fattening business in the study area which constituted about 83%, female were summed to about 18%. Married men and women (62.10%) were also revealed to participate most in cattle fattening business in the area which served to them as means of supportive income to their families. Cattle fattening in the study area was revealed to have prospect as middle aged class (20-49 years) people were mostly involved. This formed about 80% of the sampled respondents in the study area. However, it was also revealed that most of the fatteners (about50%) were not experienced. Similarly, educational levels of the cattle fatteners were revealed that above 59% had primary and non-formal education while about 42% had secondary and higher education.

Costs and returns determination revealed that ₦12, 672,462.00 was net income and ₦123, 033.61 was an average net income per head of cattle fattenened in the study area respectively. This explained how profitable cattle fattening was in the study area. It also revealed that ₦54, 813.905 is the average cost per cattle while ₦ 39,976.22 was also revealed to be an average net income.

Regression analysis employed to determine the inputs-output relationship revealed that water, medication services, farmers experience and initial weight of cattle have positive relationship with output at 0.05, 0.01, and 0.10 each levels of

probability. It was revealed in the study that length of fattening had a negative relationship which means that the longer one keeps cattle under fattening, the more costs was incurred which had an adverse effect on the total returns of the farmer. Hence it was suggested that fatteners should be mindful of how long they keep their cattle under fattening to reduce costs.

The study also revealed that water was over-utilized hence fatteners were recommended to spend less on water. In another development, medication service was revealed to be under-utilized as such more of it is required to attain to maximum economic level.

However, the analysis of problems faced by the farmers revealed that above 83% reported high cost of feeding, about 86% of the farmers reported poor price as a threat to the business while 62% complained that high cost of medication affects their fattening venture. Notably, above 89% reported lack of government support as a major factor militating against cattle fattening in the study area. About 41.70% were of the opinion that disease outbreak has been a threat to the cattle. Other problems mentioned among the farmers were poor security as reported by 26% and high cost of labour as asserted by about 7% farmers.

5.2 Conclusion

From the findings of this study, cattle fattening business was revealed to be profitable and worth venturing into as a source of income. However, water and medication services were revealed to be under-utilized while feed is over-utilized, therefore, it is recommended that farmers should increase the use of water and medication service while feed should be maximized for optimal profit maximazation.It was also discovered in the study that keeping cattle longer than necessary lead to loss of profit.

5.3 Recommendations

Based on the critical analysis of the findings of this study, the following recommendations were proffered;

(i). Farmers should form associations or cooperatives that will enable them to be accessible to loans to boast their fattening business.

(ii). farmers should learn to depend on locally formulated feeds of less cost as this will lessen cost of fattening their animals and to maximize their profit. Similarly, in the case of water, farmers should dig wells as their source of water to cut down the cost of water as fattening animals highly require water for their fattening process, this could be achieved through farmers associations or clubs instead of depending on government.

(iii). Price fluctuation in cattle market can be minimized by formation of farmers' strong union who will always stand against such numerous middle men which are main cause of price fluctuations in cattle markets.

(iv). vigilante groups should be formed from among farmers to have a joined patrol with the Government security agencies to regularly check at the activities of the armed bandies within cattle market and other fattening houses.

(v). farmers should always be at alert to strange of disease they might observe and report such immediately to any animal health personnel for immediate solution and the use of local herbs instead of orthodox medicine should be adopted as this will cut down the cost of medication services.

(vi). the existing extension services and experienced personnel should be strengthened with the necessary technology and logistics support for effective dissemination of timely innovations and in formations to farmers and relay farmers' problems back to researchers for solutions.

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APPENDIX 1: RESEARCH QUESTIONNAIRE

FEDERAL UNIVERSITY OF TECHNOLOGY, YOLA, P.M.B 2076, YOLA, ADAMAWA STATE, NIGERIA. DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

TOPIC: ECONOMIC ANALYSIS OF CATTLE FATTENING IN MUBI NORTH AND SOUTH LOCAL GOVERNMENT AREAS OF ADAMAWA STATE, NIGERIA.

Dear Respondent,

I am a Post-graduate student in the above institution conducting a research study on the mentioned topic. Please kindly fill the questionnaire as appropriate. Your responses will be treated very confidential and be used only for the purpose intended.

SANDA, Anthony Adidu

"Economic Analysis of Cattle Fattening in Mubi North and South Local Government Areas of Adamawa State, Nigeria."

SECTION A

Socio-Economic Characteristics of Cattle Fatteners

1. Name of the village……

   District…….

2. Gender Male [ ] Female [ ]

3. Age ……..years.

4. Marital Status:

   a. Married [ ]

   b. Single [ ]

   c. Divorced [ ]

   d. Widow/Widower [ ]

5. Educational Background

   a. No-formal Education [ ]

   b. Primary School Education [ ]

   c. Secondary School Education [ ]

   d. Tertiary School Education [ ]

   e. Others (specify) ……

6. House hold information

   a. Number of Children

      ……...……

   b. Number of wife (vies) if any

      …….…….

   c. Total number of dependants……

7. What is your major occupation?……..…….

8. Others if any……..

SECTION B

Fattening Activities

9. How long have you been into cattle fattening business?.....year/month?

10 Do you fatten both male and female cattle?

a. Yes [ ]

b. No [ ]

11 If not, which type do you fatten?

c. Bull [ ]

d. Caw [ ]

12 If Bull, which type of breed?

a. Adamawa Gudali [ ]

b. White Fulani [ ]

c. Red Bororo [ ]

d. All of the above [ ]

13. How do you acquire your cattle for fattening?

e. Cattle market [ ]

f. Cattle herders [ ]

c. Others (specify) ……..……

14. How many cattle can you buy for fattening at a time? ……..

15. How much did you buy each of them? ₦

16. What is the cost of transporting each of them from the market? ₦.....

17. How much did you sale each of them? ₦.....

18. How long does the bull take under fattening before sale? Wks/mths.

19. What is your total cost in fattening a bull in a fattening cycle? ₦.....

20. How do you get money for this business?

a. Loan from Banks [ ]

b. Loan from friends [ ]

c. Personal saving [ ]

SECTION C

Input/Output Data

21. What type of labour do you use in fattening your cattle?
    a. Hired Labour [ ]
    b. Family labour [ ]
    c. Both [ ]
22. What is man day? (Hours)……..
23. How much did you spend on labour per man-day? ₦ ……
24. What is the source of your water for the fattening project?
    a. Well water [ ]
    b. Pipe born water [ ]
    c. buying from water vendors [ ]
    d. Others (specify) ……..……..
25. What is the volume of water used per fattening cycle? ….. (Litres)
26 What is the total cost of water used per fattening cycle? ₦.....
27. What is the quantity of feeds used per fattening cycle? ……. (kg)
28. What is the cost of feeds used per fattening cycle? ₦.....
29. What is the approximate weight before fattening?.....kg
30. What is the approximate weight after fattening? ……..kg
31. Do you have access to medication services?
    a. Yes [ ]
    b. No [ ]
32. If yes, what is the number of medication services received? ------ (vials)
33. How much did you purchase each vial? (₦).....

34. What other facilities do you use in cattle fattening project and their costs?

Items		Depreciated costs at 10%.
a. Wheel barrow	[ ]	(₦)
b. Rakes	[ ]	(₦)
c. Jar cans	[ ]	(₦)
d. Water cans	[ ]	(₦)
e. Shovels	[ ]	(₦)
f. Feeding cans	[ ]	(₦)
Total		(₦)

35. Do you think you are making profit after all these expenses?

a. Yes [ ]

b. No [ ]

36. If yes, how much?

c. High [ ]

d. Moderate [ ]

e. Low [ ]

37. How often do extension workers visit you?

a. Very often [ ]

b. Very really [ ]

c. Not at all [ ]

38. If they do, how effective is their visit?

a. very effective [ ]

b. Little effect [ ]

c. No effect [ ]

SECTION D

Problems in Cattle Fattening

39. Mark (✓) where applicable, the problems you encounter in Cattle Fattening.

a. High cost of feeds and supplement [ ]

b. High cost of veterinary services. [ ]

c. High cost of transportation [ ]

d. High cost of labour [ ]

e. Poor pricing system [ ]

f. Poor security network [ ]

g. Lack knowledge. [ ]

h. Disease outbreaks [ ]

i. Lack of courage from the government agencies [ ]

j. Others (specify)...……

40. From the above enumerated problems, what possible suggestions do you proffer to bring a positive change in cattle fattening in your area and the nation as a whole?

a.……

b…….

c……..

d……..

e……..

f……..

g…….

APPENDIX 2

ESTIMATED WEIGHTS OF ANIMALS

Distance round the body (cm)	APPROXIMATE WEIGHT		
	Cattle/Buffaloes (kg)	Sheep/Goats (kg)	Horses/Mules/Donkeys (kg)
60		20	
65		24	
70	40	30	
75	45	36	
80	50	42	44
90	70	55	62
100	98	75	87
120	150		147
140	232		222
160	330		313
180	485		426
190	558		490

Source: Forse, (1983).