

**GOAT FARMING: INVESTIGATING THE IMPLICATIONS OF IT ON CROPS FOR OPTIMUM
ECONOMIC BENEFITS IN AKWA IBOM STATE**

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ABSTRACT

The study aimed to assess goat farming by investigating the implications of it on crops for optimum economic benefits in Akwa Ibom State. Expost-facto survey design was used in carrying out the study. The study was conducted in Akwa Ibom State. The population of the study comprises of all farmers in Akwa Ibom State. Stratified random sampling technique was used to select 40 farmers from each of the three senatorial district which gave a total of 120 respondents used for the study. The instrument used for data collection was a structured questionnaire tagged "Goat Farming and Crops Questionnaire (GFCQ). Face and content validation of the instrument was carried out by an expert in test, measurement, and evaluation in order to ensure that the instrument has the accuracy, appropriateness, and completeness for the study under consideration. The reliability coefficient obtained was 0.82, and this was high enough to justify the use of the instrument. The researcher subjected the data generated for this study to appropriate statistical techniques such percentage analysis to answer research questions. The study found out that Integrating goat farming with crop offers several economic benefits it production provides farmers with an additional source of income. Revenue from selling goat meat, milk, wool, or other products complements earnings from crop sales, thereby reducing the financial risks associated with fluctuations in market prices or crop yields. The study also revealed that goat droppings improve soil structure and moisture retention capabilities. Their organic matter content enhances soil aggregation, creating a crumbly texture that facilitates root penetration and aeration. This improved soil structure promotes better water infiltration and reduces the risk of erosion, ultimately enhancing the soil's ability to retain moisture during dry periods. On this basis it was concluded that the study of goat farming reveals its multifaceted impact on crops, emphasizing its potential to enhance ecological balance, soil fertility, and weed control. The economic benefits, spanning from diversified income sources for farmers to sustainable agricultural practices, underscore the significance of integrating goat farming into broader agricultural systems. One of the recommendations made was that the adoption of integrated farming systems that combine goat farming with crop production should be encouraged as this approach can maximize the synergies between goats and crops, promoting sustainable agriculture and optimizing economic benefits.

KEYWORDS: Goat Farming, Crops, Optimum Economic Benefits and Akwa Ibom State

INTRODUCTION

Goat farming, a classic agricultural method with deep historical roots, has received increased interest in recent years due to its potential impact on crops and, as a result, maximum economic benefits. This venture involves raising goats for a variety of purposes, including meat, milk, and fiber, making it both versatile and commercially feasible. The study of goat farming and its effects on crops has become a priority for scholars, agriculturists, and policymakers alike, since it holds promise for sustainable agriculture and rural development.

Recent research has shown that goats can adapt to a variety of environmental situations (Smith, 2017). Their foraging habit not only aids in weed control but also helps with land management, making them significant assets in agricultural environments (Dubeuf et al., 2013). Furthermore, goats' nutrient-rich dung has been acknowledged for its ability to improve soil fertility, providing a natural and sustainable alternative to synthetic fertilizers (Patra et al. 2015). Understanding these interactions is critical for developing farming systems that balance environmental resilience and economic viability.

As global agriculture faces issues such as climate change, resource scarcity, and the need for sustainable techniques, research into goat farming's impact on crops becomes critical. This study relies on seminal research by Vasta and Nudda (2008) on goat milk nutrition and Hove et al. (2019) on the economic benefits of goat farming in impoverished nations. By combining existing knowledge and undertaking new research, we hope to provide complete insights into the potential benefits and problems of integrated goat-crop farming systems. In the pursuit of optimum economic benefits, this investigation delves into the economic aspects of goat farming, considering factors such as market demand for goat products, cost-effective management practices, and potential income streams for farmers. The study aims to provide insights into the financial viability of integrating goat farming with crop production and the potential for diversification of income sources in agriculture. The investigation into goat farming and its implications on crops represents a multifaceted approach towards achieving optimum economic benefits in agriculture. By exploring the ecological, agronomic, and economic dimensions of this practice, the research aims to contribute valuable knowledge to the ongoing discourse on sustainable and resilient agricultural systems.

PURPOSE OF THE STUDY

- To find out the extent goat farming engagement in Akwa Ibom State.
- To determine the extent to which goat farming has created positive effect on crops for optimum economic benefits in Akwa Ibom State.

RESEARCH QUESTION

- What is the extent goat farming engagement in Akwa Ibom State?
- To what extent has goat farming created positive effect on crops for optimum economic benefits in Akwa Ibom State?

LITERATURE REVIEW

CONCEPT OF GOAT FARMING

Goat farming is the cultivation of goats for diverse reasons, which may include feeding, harvesting fiber, or even harvesting droppings for crop production. Goat farming is popular in Nigeria because of the high demand for goat meat, milk, and other crops in the country. According to Wikipedia (2023), goat farming involves the raising and breeding of domestic goats (*Capra aegagrushircus*) as a branch of animal husbandry. Goat farming, also known as caprine farming, is the practice of rearing and breeding goats for various purposes such as meat, milk, fiber, and skin. It has been an integral part of agriculture for centuries, providing a sustainable source of livelihood for many communities globally (Smith et al., 2018). Agrodemy (2023) stated that goat farming is the rearing of goats for commercial purposes. It involves the selective breeding of healthy and productive goats to produce high-quality meat, milk, and other dairy products.

Maher (2021) mentioned that goats are popularly known as “common man’s cow.” Goats are among the main meat-producing animals. Goat meat (chevon) is one of the preferred meats, which has huge domestic demand. Goat farming generally means rearing goats for the purpose of harvesting milk, meat, and fiber. Goat Farming (2024) mentioned that goat farming involves raising goats for multiple purposes, such as meat, milk, and fiber. Definitions.net (2024) defined goat farming as the raising and breeding of domestic goats (*Capra aegagrushircus*). It is a branch of animal husbandry. Goats are raised principally for their meat, milk, fiber, and skin. Goats efficiently convert sub-quality grazing matter that is less desirable for other livestock into quality lean meat.

Furthermore, goats can be farmed in a relatively small area of pasture with limited resources. Chinedu (2021) mentioned that goat farming involves the raising and rearing of goats on a small or large scale. FineLib (2017) additionally mentioned that goat farming is an agro-farming business categorized under animal husbandry. It involves the breeding and raising of domesticated goats for commercial purposes. It is also further necessary to note that goat farming is not essentially for meat, fiber, or dairy production but could also encompass rearing goats for the production of manure in terms of goat droppings for growing crops.

CONCEPT OF CROPS

Crops refer to plants that are cultivated for human use. Crops can be broadly categorized into two main types: food crops and cash crops. Food crops, such as grains, vegetables, and fruits, are cultivated primarily for consumption, providing essential nutrients and sustenance. On the other hand, cash crops, including cotton, tobacco, and coffee, are grown for commercial purposes, contributing to economic activities beyond mere subsistence. Crops are carefully selected by man for planting. It is the intentional act man takes to pick up select seeds, plant them, and nurture them till full growth for the purpose of consumption, either for himself, his family, or for sale.

According to National Geographic (2024), crops are plants or plant products that can be grown and harvested for profit or subsistence. By use, crops fall into six categories: food crops, feed crops, fiber crops, oil crops, ornamental crops, and industrial crops. Wikipedia (2024) mentioned that a crop is a plant that can be grown and harvested extensively for profit or subsistence. In other words, a crop is a plant or plant product that is grown for a specific

purpose, such as food, fiber, or fuel. Collins Dictionary (2024) defined crops as plants such as wheat and potatoes that are grown in large quantities for food.

Additionally, the cultivation of crops involves series of agricultural practices, including land preparation, planting, nurturing, and harvesting. Farmers employ various techniques and technologies to optimize crop yields, such as the use of fertilizers, manures, pesticides, and advanced irrigation systems. The importance of crops extends beyond basic sustenance. They play a crucial role in shaping economies, influencing trade relationships, and defining cultural practices. Different regions around the world specialize in the cultivation of specific crops based on climate, soil conditions, and local preferences, contributing to the global diversity of agricultural products.

Moreover, crops are the essence of life survival, as every organism, be it man or animal, depends on crops for sustenance and survival. As Merriam-Webster Dictionary (2024) defined it, “crops are plants that can be grown and harvested extensively for profit or subsistence. Similarly, Vocabulary.com (2024) affirmed that crops are large amounts of one kind of fruit or vegetable that are grown on a farm. Byju’s (2024) stated that crops are plants grown by farmers. Toppr (2024) also mentioned that crops are plants that are cultivated or grown on a large scale. In other words, crops are plants that are grown and harvested extensively for consumption or for profit purposes.

EFFECTS OF GOAT DROPPINGS ON CROPS GROWTH

Goat droppings, also known as goat manure, have significant effects on crop growth due to their nutrient-rich composition and potential impacts on soil structure. The utilization of goat manure as organic fertilizer can enhance soil fertility, promote plant growth, and contribute to sustainable agricultural practices (Domínguez and Edwards, 2004). Goat dung is one of the richest sources of nutrients used in soil enrichment. One of the primary benefits of goat droppings is their high nutrient content. They are rich in essential elements such as nitrogen, phosphorus, and potassium, which are vital for plant growth and development. Nitrogen, for example, is a key component of chlorophyll, the pigment responsible for photosynthesis, while phosphorus is crucial for root development and overall plant vigor. Potassium aids in various physiological processes, including water regulation and disease resistance (El-Nagerabi and Abdu, 2012). The presence of these nutrients in goat manure provides plants with the necessary building blocks to thrive.

Moreover, goat droppings improve soil structure and moisture retention capabilities. Their organic matter content enhances soil aggregation, creating a crumbly texture that facilitates root penetration and aeration. This improved soil structure promotes better water infiltration and reduces the risk of erosion, ultimately enhancing the soil's ability to retain moisture during dry periods (Rehman, Farooq, Ozturk, and Siddique, 2018). Additionally, the organic matter in goat manure acts as a substrate for beneficial soil microorganisms, fostering a healthy soil microbiome that supports nutrient cycling and overall soil health.

Furthermore, the use of goat droppings as fertilizer can contribute to the reduction of chemical inputs in agriculture. By utilizing organic sources of nutrients, farmers can minimize their reliance on synthetic fertilizers, which can have detrimental effects on soil health and water quality over time (Gebremedhin and Tadesse, 2020). This shift towards organic fertilization aligns with sustainable farming practices, promoting environmental stewardship and long-term agricultural resilience. While goat droppings offer numerous benefits, proper management is

essential to maximize their effectiveness and prevent potential drawbacks such as nutrient imbalances or excessive salinity. Incorporating goat manure into the soil through composting or a well-timed application ensures optimal nutrient release and minimizes the risk of nutrient leaching (Khan, Cao, Zheng, Huang, and Zhu, 2008). Additionally, rotational grazing practices can help distribute goat droppings evenly across the field, optimizing their benefits while minimizing the risk of nutrient accumulation in concentrated areas.

OTHER ECONOMIC BENEFIT OF GOAT FARMING ON CROPS

Goat farming offers several economic benefits to crop production through various mechanisms such as weed control, nutrient recycling, and diversification of income sources for farmers. Here's a breakdown of the economic advantages of integrating goat farming with crop production:

- **Weed Control:**

Goats are natural grazers and have the ability to consume a wide variety of plant species, including many types of weeds. By grazing goats in crop fields during fallow periods or between rows of crops, farmers can effectively manage weed populations without relying solely on herbicides (Devendra, 2012). This reduces the need for chemical inputs, thereby lowering production costs and improving overall crop yields.

- **Nutrient Recycling:**

Goats produce manure rich in nitrogen, phosphorus, and potassium, which are essential nutrients for crop growth. By allowing goats to graze on crop residues or cover crops after harvest, farmers can facilitate nutrient recycling and improve soil fertility (NRC, 2018). This reduces the dependence on synthetic fertilizers, resulting in cost savings and environmental benefits such as reduced nutrient runoff and greenhouse gas emissions.

- **Diversification of Income:**

Integrating goat farming with crop production provides farmers with an additional source of income (López, Gómez-Corteel, Díaz-Rivera, and Estévez, 2019). Revenue from selling goat meat, milk, wool, or other products complements earnings from crop sales, thereby reducing the financial risks associated with fluctuations in market prices or crop yields. Diversification also enhances the resilience of farm businesses and contributes to long-term sustainability.

- **Soil Health Improvement:**

Goat grazing can help improve soil structure and reduce compaction by trampling plant residues and incorporating organic matter into the soil. This enhances water infiltration, reduces erosion, and promotes microbial activity, leading to healthier and more productive soils (Gómez-Corteel, López, Rodríguez-Estévez, and Díaz-Rivera, 2020). Healthy soils support better crop growth and resilience to environmental stressors, ultimately contributing to higher yields and improved economic returns for farmers.

- **Integrated Pest Management:**

In addition to controlling weeds, goats can also help manage certain insect pests by consuming weed species that serve as alternative hosts or habitats for pests (Smith, 2017). By

integrating goat grazing with other pest management strategies such as crop rotation and biological control, farmers can reduce pest populations and minimize the need for chemical pesticides, thus lowering production costs and potential environmental risks.

TYPES OF CROPS THAT USE GOAT DROPPINGS AS MANURE

Goat droppings are rich in nitrogen, which makes them an excellent soil conditioner. Goat droppings, as noted by Agri Farming (2024), can be used in any type of garden-like flowering plant, such as herbs, vegetables, trees, and fruits. The following are crops that can use goat droppings as manure:

- **Vegetables:**

Vegetables such as tomatoes, peppers, and leafy greens respond well to goat manure. The organic matter in goat droppings improves soil structure and provides essential nutrients like nitrogen, phosphorus, and potassium necessary for robust vegetative growth and fruit development.

- **Fruits:**

Fruit-bearing trees and plants, including apple trees, citrus fruits, and berries, can benefit from goat manure. The gradual release of nutrients from goat droppings supports healthy fruit development and enhances the overall productivity of fruit crops.

- **Root Crops:**

Root vegetables like carrots, potatoes, and radishes thrive when cultivated in soil enriched with goat manure. The improved soil texture and nutrient content contribute to better root development and increased yields.

- **Legumes:**

Leguminous crops such as beans, peas, and lentils can utilize the nitrogen content present in goat manure. Nitrogen is a crucial element for legume crops as it promotes better nitrogen fixation, fostering healthier plant growth and improved yields.

- **Herbs:**

Culinary and medicinal herbs, including basil, oregano, and mint, can benefit from the nutrient-rich properties of goat manure. The organic fertilizer enhances the flavor and aroma of herbs while providing the necessary nutrients for vigorous growth.

- **Grains:**

Cereal crops like wheat, barley, and oats can be cultivated with the help of goat manure. The balanced nutrient profile of goat droppings supports grain formation and contributes to higher yields in cereal crops.

OTHER USEFULNESS OF GOAT FARMING

Apart from goat farming being useful in the production of manure, goat farming has numerous other usefulness to mankind which include:

- **Meat Production:**

One of the primary contributions of goat farming is the production of high-quality meat. Goats are efficient converters of feed into meat, making them a valuable source of protein for human consumption (Devendra and McLeroy, 2013). The meat, commonly referred to as chevon or goat meat, is lean and rich in essential nutrients, providing a healthy alternative to other red meats (Adeyemi and Ayoade, 2018).

- **Milk Production:**

Goat farming is also significant for milk production. Certain goat breeds, such as Saanen, Nubian, and Alpine, are renowned for their milk production capacity. Goat milk is nutritionally dense, containing higher levels of essential minerals and vitamins compared to cow's milk (Haenlein and Caccese, 2017). It is a valuable source of calcium, protein, and other essential nutrients, making it suitable for individuals with lactose intolerance.

- **Land Management:**

Goats are natural grazers and browsers, making them effective in controlling unwanted vegetation. Their ability to clear overgrown areas helps manage weeds and reduce the risk of wildfires, contributing to sustainable land management practices (Jackson et al., 2018).

- **Bioenergy Production:**

Residues from goat farming, such as dung and crop residues fed to goats, can be utilized for bioenergy production. Biogas generated from goat manure can serve as a renewable energy source for cooking and heating, contributing to sustainable energy practices in rural areas (Kumar and Singh, 2017).

- **Biodiversity Conservation:**

Goat farming also plays a role in biodiversity conservation. By promoting the sustainable breeding and conservation of indigenous goat breeds, genetic diversity in livestock is preserved, contributing to overall biodiversity (FAO, 2020).

- **Livelihood Support:**

Goat farming serves as a significant source of livelihood for many rural communities. It provides employment opportunities and income generation for small-scale farmers, particularly in regions where other forms of agriculture may be challenging (Peacock, 2016).

- **Fiber Production:**

In addition to goat droppings being useful as farmland manure, goats also provide valuable fiber. Certain goat breeds, such as Angora and Cashmere goats, are specifically raised for their high-quality fibers. Angora goats produce mohair, a luxurious and lustrous fiber, while Cashmere

goats yield fine cashmere wool. The fiber from these goats is in demand for the textile industry, adding a lucrative dimension to goat farming (Smith, 2019).

METHODOLOGY

Expost-facto survey design was used in carrying out the study. The study was conducted in Akwa Ibom State. The population of the study comprises of all farmers in Akwa Ibom State. Stratified random sampling technique was used to select 40 farmers from each of the three senatorial district which gave a total of 120 respondents used for the study. The instrument used for data collection was a structured questionnaire tagged “Goat Farming Implications and Crops Questionnaire (GFCQ). Face and content validation of the instrument was carried out by an expert in test, measurement, and evaluation in order to ensure that the instrument has the accuracy, appropriateness, and completeness for the study under consideration. The reliability coefficient obtained was 0.82, and this was substantially high enough to justify the use of the instrument. The researcher subjected the data generated for this study to appropriate statistical techniques such percentage analysis to answer research questions.

RESULTS AND DISCUSSIONS

Research Questions 1:

The research question sought to find out the extent of goat farming engagement in Akwa Ibom State. To answer the research question percentage analysis was performed on the data, (see table 1).

Table 1:
Percentage analysis of the extent of goat farming engagement in Akwa Ibom State.

EXTENTS	FREQUENCY	PERCENTAGE
HIGH EXTENT	45	37.5**
LOW EXTENT	44	36.67
VERY LOW EXTENT	31	25.83*
TOTAL	120	100%

** The highest percentage frequency

* The least percentage frequency

SOURCE: Field survey

The above table 1 presents the percentage analysis of the extent goat farming engagement in Akwa Ibom State. From the result of the data analysis, it was observed that the highest percentage (37.5%) of the respondents affirmed that the extent goat farming engagement in Akwa Ibom State is high, while the least percentage (25.83%) of the respondents stated that the extent is very low.

Research Questions 2

The research question sought to find out the extent to which goat farming has created positive effect on crops for optimum economic benefits in Akwa Ibom State, (see table 2).

Table 2:

Percentage analysis of the extent to which goat farming has created positive effect on crops for optimum economic benefits in Akwa Ibom State.

EXTENTS	FREQUENCY	PERCENTAGE
VERY HIGH EXTENT	71	59.17**
HIGH EXTENT	49	40.83*
TOTAL	120	100%

**The highest percentage frequency

*The least percentage frequency

SOURCE: Field survey

The above table 2 presents the percentage analysis of the extent to which goat farming has created positive effect on crops for optimum economic benefits in Akwa Ibom State. From the result of the data analysis, it was observed that higher percentage (59.17%) of the respondents affirmed that the extent to which goat farming has created positive effect on crops for optimum economic benefits in Akwa Ibom State is very high, while the less percentage (40.83%) of the respondents stated that the extent is high.

CONCLUSION

In conclusion, the study of goat farming reveals its multifaceted impact on crops, emphasizing its potential to enhance ecological balance, soil fertility, and weed control. The economic benefits, spanning from diversified income sources for farmers to sustainable agricultural practices, underscore the significance of integrating goat farming into broader agricultural systems. As we navigate challenges in global agriculture, understanding and harnessing the symbiotic relationship between goats and crops could pave the way for resilient and economically viable farming practices. The insights gained from this investigation not only contribute to the optimization of economic benefits but also advocate for the sustainable and holistic development of agricultural landscapes.

RECOMMENDATIONS

- The adoption of integrated farming systems that combine goat farming with crop production should be encouraged. This approach can maximize the synergies between goats and crops, promoting sustainable agriculture and optimizing economic benefits.
- Implement comprehensive educational programs for farmers on the benefits and best practices of integrating goat farming with crop cultivation. This outreach should cover sustainable management practices, proper waste utilization, and the economic advantages of diversifying their agricultural activities.
- Provide financial incentives and support mechanisms for farmers looking to adopt integrated goat-crop farming systems. This could include subsidies for infrastructure development, access to credit facilities, and grants for adopting sustainable practices.
- Facilitate market linkages for goat farmers, ensuring they have access to markets for both goat products and crops. Strengthening value chains will enhance the economic viability of integrated farming systems and encourage more farmers to adopt this approach.

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