

**ECONOMIC EVALUATION OF LAND TENURE OF
TAUNGYA FARM IN SOME SELECTED LGA IN EDO
STATE, NIGERIA**

BY

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**DEPARTMENT OF FOREST RESOURCES AND
WILDLIFE MANAGEMENT
FACULTY OF AGRICULTURE
UNIVERSITY OF BENIN
BENIN CITY**

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**A PROJECT REPORT SUBMITTED TO THE DEPARTMENT
OF FOREST RESOURCES AND WILDLIFE MANAGEMENT,
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AND WILDLIFE MANAGEMENT)**

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CERTIFICATION

This is to certify that this research project was carried out by **ASHINEDU SARAH OKPALA with the matriculation number AGR1109647** under the guidance of project supervisors and approved by Department of Forest Resources and Wildlife Management , Faculty of Agriculture, University of Benin, Benin city, Nigeria.

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Date: _____

DEDICATION

This research work is dedicated to God Almighty for his infinite mercies, strength, guidance and protection above all his grace, love, and favour. I also dedicate this work to my parents and all my siblings for their care, concern for their show of love, encouragement and support.

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I owe my immense gratitude to my wonderful parents Mr. and Mrs. G. Okpala, and to my lovely Husband Mr. O. Eghosa Onaghinor, and my siblings for their love, encouragement, prayers and supports.

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ABSTRACT

The study evaluate land tenure of taungya farm in Edo State, Nigeria. Data were collected through primary and secondary sources. The primary data were obtained through the use of well-structured questionnaire administered on 127 respondents in six local government areas practicing taungya farming in government reserved forest. The data collected were analyzed with descriptive statistics summarized in tables and charts and inferential statistics with the use of analysis of variance (ANOVA) at 5% level of significant difference. The results showed significant difference ($P<0.05$) among the various locations of the respondents farm land, which dominate any other location considered in the studies. The result shows that the state ownership stood at 69% while other forms of ownership by the respondents were communal, traditional, and private ownership which accounted for 16, 11 and 4% respectively. The results also showed that majority (60%) of the respondents affirmed that their farm size ranges from 2-4 hectares. While 24% and 16% of the respondents had less than 2 hectares and 5-7 hectares respectively. The results showed significant difference ($P<0.05$) in land rate per hectare among the various years under review. The rate accruable in 2020 till-date differ significantly ($P<0.05$) from every other year under review. The results revealed the various sources of financing the taungya farm, the study confirms that 54% of the respondents obtained their source in financing the taungya farm practice through individual/personal contribution. 18%, 16% and 12% of the respondents affirmed for borrowed money, government grant and government loan respectively. The results revealed significant difference ($P<0.05$) between the selling price and cost price of the arable crops under review. The selling prices dominated the cost prices of the arable crops in taungya practices. Despite the profitability measure and

yield from the farming system, the farmers experience inadequate minority from the relevant authorities through the duration for land use rent and incentives from government is one of the mitigation the taungya farmer agitated for in the study area.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Land tenure is the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land. (For convenience, “land” is used here to include other natural resources such as water and trees.) Thus, land tenure is an institution, i.e., rules invented by societies to regulate behavior. Rules of tenure define how property rights to land are to be allocated within societies. They define how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints. In simple terms, land tenure systems determine who can use what resources for how long, and under what conditions. While Taungya land tenure as a land use management is geared towards the raising of forest crops in conjunction with temporary agricultural crops in which a short phase of food crop production is used as a silvicultural method to ensure the establishment of timber trees (King, 1968; Evans, 1982; Wiersum, 1982; Okigbo, 1985). Generally, this practice involves some form of government intervention in the establishment and control of forest plantations (Ruthenberg, 1980). The original scheme was to give rural dwellers or farmers a piece of land that they could clear and cultivate for about 3 years while the trees are young. After the initial 3-year cropping period, the trees are managed as a mono-culture forestry unit (Enabor, 1975; Goswami, 1982; Watson, 1983), then the farmers are ordered, in accordance with the specifics of the taungya agreement, to discontinue cropping and maintenance of food crops in between the trees, most especially when there is closure of the tree canopy.

Land tenure is determined by governmental laws, which influence farmers' profit margins and land use decisions (Ehui *et al.*, 1994; Lele and Stone, 1989). Specifically, the land tenure plays one of the vital roles in shaping farmers' land-use decisions (Li *et al.*, 1998; Feder and Nishio, 1999; Pandit and Thapa, 2003; Rasul *et al.*, 2004). However, their investment decisions may be affected if they are not sure how long they would be allowed to use the ownership right. Especially if the tenant cultivators are reluctant to make investments in land management if they do not secure land tenure rights that make them vulnerable to eviction by government. If property rights are absent and if land tenancy is insecure, farmers do not care much about the land use and though concentrate on short terms profit maximizing at the cost of accelerating the degradation of land (Angeles, 1988; Feder and Nishio, 1999; Cairns, 2003).

Insecure land tenure or the lack of land ownership also restricts the farmers' access to credit that are required for improved land practices (Fede *et al.*, 1988; Rasul, 2003). This lack of access to credit forces them to go for traditional land-use practices, despite their willingness to change (Thapa, 1998b; Rasul and Thapa, 2003; Rasul, 2003). Thus, national policies influence the land-use systems by influencing institutional arrangements such as credit and marketing facilities, and infrastructure development (Bergeron and Pender, 1999; Rasul, 2003). Land tenure institutions have long been considering the agricultural and economic development but land reform has varied widely by geographic regions (Maxwell and Wiebe, 1998). In East Asian cases, land reform meant "land to the tiller" or breaking up of landlord/tenant relations and in Africa, land tenure reform typically refers to the legal changes in the form of land tenure intended to enhance

security of tenure with a view to enhancing productivity and encouraging better land conservation practices.

1.2 Statement of the Problem

Over the decade it is widely known that in rural tropical areas, most economic activities have been largely exploitative, extractive and damaging, for example lumbering, mining sand and/or soil excavation with little or no reforestation. Even, if reforestation programs were put in place after the exploitation, the needs of the local communities were compromised. In many cases, management of forest resources are not sustainable thus it failed to address the social, economic, cultural or political limitations of the people which is predispose to fail therefore, the social economic and environmental problems regarding the taungya land use pattern of the local communities are jeopardized (FAO, 1984). However, one major constrain of most taungya farmers in rural areas is the limited resource use. Despite the important role of the taungya farmers in the development of the land use management for plantation, the only benefit derived by these farmers is food produced for a limited period of time after which the farmers will be forcibly ejected upon closure of the tree canopy by the management of the forest. This management practice may influence negative perception on the establishment of taungya land tenure practice. Therefore, there is an urgent need to study and document the taungya land tenure to ensure that taungya land tenure practice is strictly practiced in the study area.

1.3 Objectives of the Study

The main objective of the study will evaluate land tenure of taungya farming system in Edo-State.

The specific objectives are to:

1. evaluate the yield annually with the mandatory three years.
2. evaluate the land rate pay for taungya farm per hectare from 1960-2000.
3. determine the size of plot allocated to taungya farmers in an allowable period.
4. determine the land tenure of the farmers adopted.
5. evaluate the problems mitigating adaptation of taungya land tenure that should not exceed this year.

1.4 Justification of the Study

Taungya farming practice has played a vital role in the management of forest plantation and improvement in livelihood of rural dwellers through sustainable land use practices, poverty reduction and food security. In fact, the livelihoods of the majority of Nigerians, food security and poverty reduction cannot be achieved unless issues of access to land, security of land tenure and favorable taungya land tenure system is adopted for farmers in a sustainable manner (Olu, 2004). Taungya land tenure practices can help in sustainability of output, especially tree and crop component in the land scape. However increasing pressure on limited land resources is a problem facing rural area in some agrarian communities in the state. Therefore, taungya land tenure can help mitigate deforestation, degradation of land because it addresses the general issues of taungya land use pattern. It is vital for soil and land conservation which also results to the alleviation of rural poverty (ICRAF, 1993).

1.5 Scope of the Study

The study will be carried out to ascertain the land tenure of taungya farming system in Edo-State. Generally, the study will cover some forest reserve located in (6) local government areas of Edo state. The areas include Oredo, Orhiomwon, Ovia South West, Uhunmwode, Esan South East and Etsako West local government area.

1.6 Statistical Analysis

All data collected will be analysed using descriptive statistics of frequency and percentages summarized in table and inferential statistic using analysis of variance (ANOVA) as recommended by (Alika, 2006) to determine significant differences among variables that will be considered in the study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The Taungya System

Kio (1972) has described taungya system, as a system of plantation establishment in which willing shifting cultivators are engaged to establish and tend tree crops together with

temporary agricultural crops. However, it is worth noting that taungya system and shifting

cultivation are essentially two different land use systems both in time and space. While shifting cultivation is a sequential system of growing woody species and agricultural crops,

taungya consists of the simultaneous combination of the two components during the early stages of forest plantation establishment. Taungya system was however considered as a low-cost mechanism of governments for forest plantations development that engaged farmers who are willing to plant and care for forest crops whilst being allowed to grow food crops in between the young tree crops for three to four years (Enabor, 1975; Goswami, 1982; Watson, 1983;).

Thus, Taungya is a land use system in which rural farmers are allowed to cultivate agricultural crops for the first few years between the planted seedlings of trees. Taungya is a land management system which consists of the raising of forest crops in conjunction with temporary arable crops in which a short phase of food crop production is used as a silvicultural method to ensure the establishment of timber species (King, 1968; Evans, 1982; Wiersum, 1982; Okigbo, 1985).

According to Ford-Robertson (1971), taungya was a common practice in medieval Europe and has been developed into a mechanism for reforestation, and praised as a panacea to solve problems of shifting cultivation in many parts of the tropics. Again, taungya system was promoted in Burma in 1855 by Sir Dietrich Brandis to arrest the destructive effects of shifting cultivation (Von Hesmer, 1966), and Annual reports on forest administration in Burma showed that teak plantations began in 1863 in Burma (MacGillivray, 1990). Today the Taungya system is known by different names, some of which are also used to denote shifting cultivation (Okigbo, 1985). Blanford (1958) has reported that the word Taungya originated and practiced in Myanmar (Burma) and means hill (Taung) and cultivation (ya). Taungya system is therefore, essentially a modification of the traditional shifting cultivation, but various forms can be found in different parts of the tropics (Nair, 1984). Gorman (1969) mentioned that evidence from excavations at Ban Chieng, Northeastern Thailand, indicated that people have cultivated plants in the area for centuries. The system involved combination of trees, root crops and seed crops.

In Africa, it was reported to have been first introduced in Kenya as early as 1920's. Taungya system has been employed to establish plantations successfully at low establishment costs in South East Asia, East Africa, and West Africa including Nigeria and Ghana. Taungya system is considered to be one of the low-cost forms of government compensatory forest plantation establishment which enlists farmers who are willing to plant and care for forest crops in return for being allowed to grow food crops for 4-5 years while the trees are young (Enabor, 1975; Goswani, 1982; Watson, 1983). Biologically and economically the taungya system has proven to be a successful partial integration of food crops and tree husbandry. While taungya has been tried in Africa

(Lowe, 1987; Nwonwu, 1987) and the America (Weaver, 1989), it is practiced most extensively in Southeast Asia.

As such, recent improvements in taungya plantations have occurred principally in South Asia. According to (King, 1968), the origin of taungya system can be traced back to the 1850s in Burma, where the system was used as a means of replanting teak on badly degraded land. In 1806, U. Pan Hle, a Karen tribesman in the Tonze forests of Thararawaddy Division in Myanmar (Burma), established a plantation of *Tectona grandis* by using the taungya system that the Governor. It is considered that the method of the taungya system as the most efficient way of planting teak (Blandford, 1958), and Tran (1983) also reported that U Pan Hle, a Karen tribesman, might have first used the taungya system for the establishment of teak plantations as early as crops.

According to Hailey (1957), taungya system became widespread and was introduced into South Africa as early as 1887. Again, in 1890, taungya system was taken from Burma to the Chittagong and Bengal areas in colonial India (Raghavan, 1960). Most of the forest plantations established in the tropical world, particularly in Asia and Africa, owe their origin to the taungya system (von Hesmer, 1966, King, 1979). According to Brookman-Amissah (1978), taungya system was introduced in Ghana as a silvicultural mechanism of improving the stocking of forest reserves deficient in economic species due to over-exploitation and poor natural regeneration.

2.2 Land Tenure

Land tenure security and market prices of agricultural commodities are determined by governmental laws and agricultural policies, which in disguise influences farmers profit margins and land use decisions (Ehui *et al.*, 1994; Lele and Stone, 1989). Specifically, the land tenure plays one of the vital roles in shaping farmers land-use decisions (Li *et al.*, 1998; Feder and Nishio, 1999; Pandit and Thapa, 2003; Rasul *et al.*, 2004). In areas where shifting cultivation is common, farmers need much investments in land development. However, their investment decisions may be affected if they are not sure how long they would be allowed to use the ownership right. The tenant cultivators are reluctant to make investments in land management if they do not secure land tenure rights that make them vulnerable to eviction by landlords or government. If property rights are absent and if land tenancy is insecure, farmers do not care much about the land use and though concentrate on short terms profit maximizing at the cost of accelerating the degradation of land (Angeles, 1988; Feder and Nishio, 1999; Cairns, 2003).

Insecure land tenure or the lack of land ownership also restricts the farmers access to credit that are required for improved land practices (Fede *et al.*, 1988; Rasul, 2003). This lack of access to credit forces them to go for traditional land-use practices, despite their willingness to change (Thapa, 1998b; Rasul and Thapa, 2003; Rasul, 2003). Thus, national policies influence the land-use systems by influencing institutional arrangements such as credit and marketing facilities, and infrastructure development (Bergeron and Pender, 1999; Rasul, 2003). Land tenure institutions have long been considering the agricultural and economic development but land reform has varied widely by geographic regions (Maxwell and Wiebe, 1998). In Latin American cases, land reform implied changes in the scale of land holdings through redistribution of land resources among the

rural population and breaking up of big estates. In East Asian cases, land reform meant “land to the tiller” or breaking up of landlord/tenant relations and in Africa land tenure reform typically refers to the legal changes in the form of land tenure intended to enhance security of tenure with a view to enhancing productivity and encouraging better land conservation practices. In brief, the land reforms are concentrated to food security, greater equity, productivity, better conservation practices from changes in tenure. Thiesenhusen (1995) noted the following outcomes from land tenure reform: (i) Food security, (ii) reduction in social polarity, (iii) increased investment, (iv) transparent production incentives, (v) poverty reduction, (vi) increased employment, and (vii) greater equity.

2.3 Economic Potential of Taungya Farming

Economic considerations are among the most important factors that determine the value and feasibility of agroforestry to the land user (Nair, 1993). The system is an aspect of farm forestry that encourages a deliberate integration of woody perennials (trees, shrubs, palms, bamboos among others) with agricultural crops and/or animals on the same land management unit in form of spatial arrangement or time with the aim of enhancing soil fertility and increasing farmers income with the use of economic trees (Akinbile *et al.*, 2007).

Thus, some economic benefits associated with taungya system consist of provision of fuelwood, non-timber forest products (NTFPs), generation of household income and plantation establishment. Fuelwood is obtained from thinned trees and pruned branches of the woody perennials in the taungya farm settings. Essentially, it is used for the

purpose of cooking, heating or energy generation, especially people living in rural areas (Eldirdiri and Adam, (2010).

2.4 Benefit of Taungya System of Farming

Taungya provides Non-Timber Forest Products (NTFP's) to farmers comprising of a wide range of products such as fruits, seeds, roots, chewing gum, resin, medicinal plants, honey, bushmeat, including birds (Okafor, 1994). The system aids plantation establishment with low labour input due to the fact that taungya farmers provide free labour services for site preparation and planting operation (Ball, 1977). Therefore, it minimizes cost on one hand and increases profit on the other hand. It creates employment for the people who are opportune to farm on the plots. In fact, people are also involved in activities like plantation management, timber extraction, harvesting fruits, nuts and leaf as well as sales of the products (Raintree *et al.* 1985). The system provides raw materials for many types of industries such as pulp and paper industry, furniture industry as well as poles of tree of certain species of *Tectona grandis* used as poles for electricity transmission (FORMECU 1999). Taungya system increases farmers income because of low cost of factor input due to no cost and no fertilizer application in the system. This also reflects on cost of weeding which is often low in taungya farms. Here the number of times for weeding is usually fewer than when the system is not adopted (Enabor 1975). Thus taungya like most agroforestry practices is geared towards making some profits for both farmers and forestry department in Edo State. This is because profit is the major incentive in any enterprise (Popoola, 1998). Some economic cost-benefit analytical studies have demonstrated that agroforestry technologies such as alley cropping, forest

farming, and silvopasture generate a higher rate of return on investment than conventional agriculture or forestry enterprises and profit margin of N128,673.00 ha¹yr¹ (Current *et al.*, 1995 and Adesiyani, *et al.*, 2007). Redhead and Maghembe, (1981) noted that, good food crops yield is obtained in first year of intercropping, but lower in the second and subsequent years with tree crop attaining canopy closure. The study focuses on benefits accruable to the farmers and revenues generated by government from the system.

2.5 Contribution of Taungya Plantations to Socio-Economic Development

Taungya plantation development has for a long time been identified as one of the important strategies required to meet the demand for wood resources in Africa, where the rate of forest cover loss remains high at 1.7 % per year since 1990 (FAO, 2000). Taungya system is an agroforestry system which combines production of forestry tree crop and agricultural crops on the same plot. It is often employed by governments, like that of Ghana, to establish plantations on degraded forest lands as a means of forest rehabilitation.

Taungya system tends to satisfy a social need for land cultivation and establishment of plantation at cheap cost to the government (Nair, 1989; Schlögl and Beer, 2001). For example, the Forest Services Division of the Forestry Commission in Ghana, have about 40,000 hectares of productive plantation in the country. Of these, 38,000 hectares in High Forest Zone within the Ashanti and Brong-Ahafo Regions, 1,5000 hectares in the

three Northern Regions and 1,4000 hectares in the Volta Region. However, it is estimated that more than 50 % of these plantations have a stocking of less than 300 good stems per hectare. Only about a third of these plantations have a basal area in excess of 18 m² ha⁻¹ probably because the plantations were neither pruned nor thinned until recently when there was an upsurge in the demand for poles (Agyeman *et.al.*, 2003), for electrification and other purposes.

2.6 Taungya Land Tenure and Use on Environmental Sustainability in Edo State

In Edo state a very strategic socio-economic asset, particularly in the rural societies where wealth and survival are measured by control of, and access to land (Titilola & Jeje, 2008). The accessibility of agricultural lands especially in the rural communities were the most local dwellers, depends largely on taungya land tenure system and the extent of competition by non-agricultural land uses (Udoh, 2000). Land tenure systems influence the use to which land is put for economic and social development. Land tenure is a mix or bundle of entitlements (rights and duties) concerning the use of land resources. It covers the rules under which those rights and duties are exercised and the time horizon or guarantee of continued claim to such entitlements (Bromley, 1991). Although, tenure systems vary from one rural community to another, it is pivoted on three broad systems of communal, individual and family ownership. If the taungya farmers do not have secure land rights, they will have few incentives to engage in sustainable agricultural production or to consider the long-term environmental impact of over-exploitation of the land's nutrients (Oyekale, 2012).

In the absence of rational and conscious sustainable exploitation of the physical and natural resources like land, irreplaceable and probably irreversible damages will inevitably result. This will be catastrophic for food production and rural development. With the continued growth of the human population across the most communities where farming is the major occupation of the local people, competition for limited land resources has steadily increased over recent years and most communities in the state, for example the Edo north and central, have experienced an intensive use of the arable land for taungya farming. In fact, scholars like Buckles and Erenstein (1996) and Erbaugh (1999) have affirmed the potential of achieving agricultural growth through intensification. However, commensurate use of modern inputs was identified as a fundamental condition for sustainable growth through increased land-use intensity. In the absence of this, increased land-use intensity could lead to continuous depletion of soil fertility, decline in productivity, loss of soil structure, soil erosion and land degradation (Cassman 1999; Erbaugh 1999). The intensity of land use has been recognized as one of the most significant human alterations to the global environment (Matson, Parton, Power and Swift, 1997).

More so, eroding soils, deteriorating rangeland, infertility of soils, dwindling forests and polluted water bodies, are results of environmental mismanagement, especially from land use. In order to sustain the environment in the state via agricultural land tenure and use, there is a need to understand the relationship between land tenure and use and environmental sustainability to the ecosystem. Hence, sustainable environmental-friendly agriculture and rural development should be the overriding issue in future planning and

this, among other requirements, demands adequate knowledge, sensitivity towards land ownership and management.

CHAPTER THREE

METHODOLOGY

3.1 Study Area

The study was carried out in Edo State, Nigeria. The State situates between latitude 06° and 7°20'N and longitudes 05°44'8 and 06°45'E. The state is bounded in the East by Anambra State, in the north by Kogi State, in the West by Ondo State and in the south by Delta State (FORMECU, 1999).

The relief ranges from generally flat to gently undulating with elevation increasing northwards from approximately 50m to 300m. The landscaping is interrupted by an east sandstone scarp found in some portions of the state. It extends from Benin City to Uromi with elevation exceeding 200m in the eastern part of the state (FORMECU, 1999). There are two major seasons in a year comprising of rainy and dry seasons. The former starts from March to November while the latter starts from November to February, (Okoro, 2002).

There are three classes of soil in the state, which consists of rainforest, wetland and savanna soils. Rainforest soils are very deep and moderately deep, well drained and composed of sandy loam (Soil Survey, 1990).

The seasonal rain fall distributions in the state is between 1250 and 1500mm. the state is mostly covered by moist tropical forest with lowland rainforest covering 76.5% of the total land area of the state (FORMECU, 1999). The distribution of rainfall is markedly bimodal, with a lower peak in July and August (Resources Inventory and Management

Limited, 1992). The mean temperature varies between 25°C in the south and 34°C in the North while the relative humidity ranges from 79 to 90% (Beak and Geomatics, 1999).

3.2 Sampling Method

Preliminary visits were made to Forestry Department and Area offices in Ministry of Environment to elicit information concerning the total number of local government areas where taungya farming is being practiced in forest reserve as well as the total number of taungya farmers in the area under review.

Multiple sampling was applied in the study. Firstly, 75% sampling intensity was applied in 8 local government areas where taungya farming was practiced in the state in order to randomly select 6 local government areas namely; Ovia North East, Etsako West, Uhunmwuonde, Esan North East, Orhionmwon and Ikpoba-Okha. Secondly, 50% sampling intensity was applied to the total number of taungya farmers in the selected local government areas to obtain 124 respondents for the study (Table 3.1).

Table 1: Locations and Sampled respondents in the Study Area

75% SI LGAs	TNF	50% SITF
Ovia N. E.	58	29
Etsako W.	35	18
Uhunmwuonde	50	25
Esan N. E	30	15
Orhionmwon	54	27
Ikpoba-Okha	26	13
Total	253	127

Source: Field Survey, 2021.

Key:

SI LGAs: Sampling intensity for local government areas

TNF: Total number of taungya farmers
SITF: Sampling intensity for taungya farmers

A total of 127 copies of questionnaire was distributed in all the locations selected for this study.

3.3 Data Collection

Data was collected through primary and secondary sources. The primary data was collected through the administration of questionnaire to the taungya farmers. The questionnaire was used to elicit information from the farmers about the study under review. Personal interview with the respondents was also carried out to get more information on the subject matter (Plates 1 and 2). Field assistants were deployed with the use of local dialects for ease of communication during the course of study. The secondary data was collected from records, documents and reports from Forestry Department and Area Offices, Ministry of Environment, as well as literatures, Journals, and internet etc.

3.4 Data Analysis

Data collected was analyzed using descriptive statistics of frequency and percentages summarized in tables and charts and inferential statistics with the use of analysis of variance (ANOVA) at 5% level of significance. Ducan multiple range test was used to separate the means of variables that was significant at 5% level.



Plate 1: Taungua farm along with arable crops



Plate 2: Interview session with the farmers

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Results

The results showed significant difference ($P < 0.05$) among the various locations of the respondents farm land, which dominate any other location considered in the studies (Table 1).

Table 2: Location of respondent's farm land

Locations	WCL	WRL	WFL
Ovia N. E.	9	5	15
Etsako W.	5	3	9
Uhunmwuonde	7	4	14
Esan N. E	5	2	8
Orhionwon	8	5	11
Ikpoba-Okha	4	2	7
Mean	6.3^b	3.5^b	10.7^a

Source: Field Survey, 2022

Key:

WCL: within Communal Land

WRL: within Rented Land

WFL: within Forest Land

The findings indicates that farm within forest land (WFL) dominated other farming locations in the foregoing analysis. These observations could be attributed to the fact that farmers may have a preference for adopting government land for taungya farming due to the simplicity of tenancy as compared to other form of land use system. This is not in agreement with viewed expressed by (Ogundle and Okoruwa, 2006) who reported that

government owned land for taungya farming influenced farmers decisions for farmed purpose. This is apparent that land security has the tendency of influencing farmer willingness to adopt farming system in a safe farm land location.

The result showed that the state ownership stood at 69% while other forms of ownership identified were communal, traditional, and private ownership which accounted for 16, 11 and 4% respectively. (Table 2).

Table 3: Land tenure practice in Edo State

Variables	Frequency	Percentage
Private ownership	5	4
Traditional land tenure	14	11
State ownership	85	69
Communal land tenure	20	16
Total	124	100

Source: Field Survey, 2022

The findings indicated that the farmers engaged in land tenure practices on State ownership rent for their taungya farming is to a large extend could have been influenced by the cost implication of acquiring land for rent which might have played a significant role in influencing the choice of farmers. This finding is consistent with the report made by Mayong and Houndekon (2000) who stipulated in their study that 12.3% majority of farmers were farming on inherited land while 50% of farmers were practicing taungya land tenure system in government approved lands.

The results revealed significant difference ($P < 0.05$) among the various period spent on a given plots of land, which was dominated by 4-6 years than other periods allowed for taungya farming in (Table 3).

Table 4: Period spent on a given plots of land for taungya farming (Yrs.)

Locations	≤3	4-6	>6
Ovia N. E.	12	14	3
Etsako W.	6	10	2
Uhunmwuonde	8	13	4
Esan N. E	5	8	2
Orhionwon	7	14	3
Ikpoba-Okha	4	7	2
Mean	7.0^b	11.0^a	2.7^c

*Mean with same letters are not significant

Source: Field Survey, 2022

The study indicated that majority of the farmers spent more farming period such as between 4-6years period on a given plot of land allocated for taungya farming practice. These findings could be attributed to the short life span of arable crops which might have influenced the less period of land use for taungya farming in the study area.

Figure 4.1 shows that majority (60%) of the respondents affirmed that their farm size ranges from 2-4 hectares, while 24 and 16% of the respondents noted that they had less than 2 hectares and 5-7 hectares respectively.

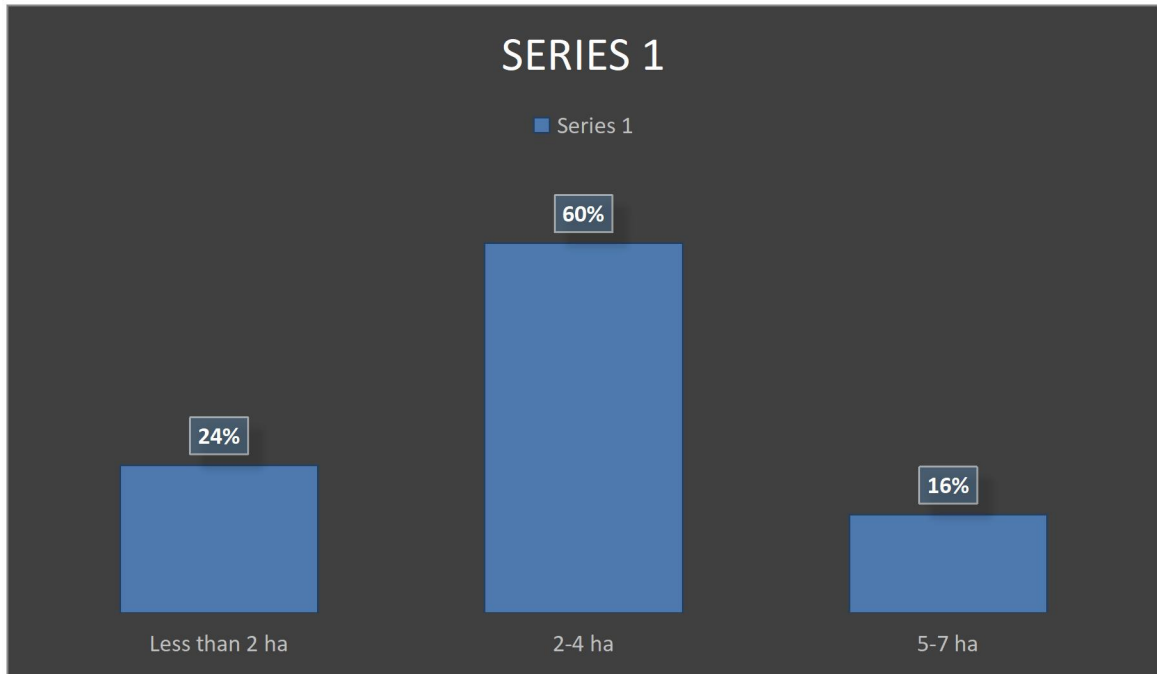


Figure 1: Size of land allocated to the taungya farmers

The findings shows that there are differences in the respondent size of land acquisition per hectare. This could be attributed to non-availability of land as the majority of the respondents have small landholding problem with land tenure, which varied in the range of land size allocation of the farmers.

The results showed significant difference ($P < 0.05$) in land rent per hectare among the various years under review. The rent accruable in 2020 till-date dominated every other years under review (Table 4).

Table 4: Land rate per hectare in Edo State (₦)

Locations	2000-03	2004-07	2008-11	2012-15	2016-19	2020 Above
Ovia N. E.	2000	2500	2500	5000	6000	10000
Etsako W.	1500	2000	2500	3000	5000	7500
Uhunmwuonde	2000	2500	2500	5000	6000	10000
Esan N. E	1000	2000	2000	3000	4500	6000
Orhikomwon	2000	2500	2500	5000	6000	10000
Ikpoba-Okha	2000	2500	2500	5000	6000	10000
Mean	1750^d	2333^d	2417^{cd}	4333^c	5583^{bc}	8917^a

Source: Field survey, 2022

The findings revealed a regular increase from the start of year 2000 - 2003 with an increase proportion in 2012-2015. This trends could have some correlation with changes in cost of living and other. This could also be microeconomic variables attributed to various factors (such as increase in rent rate, population tend, cost of living inflation) which might have influenced the land rent per hectare and the demand for land use in the study area.

The results revealed the various sources of financing the taungya farm, the study confirmed that 54% of the respondents obtained their source of financing the taungya farm individual/personal contribution, while 12% of the respondents affirmed that they finance the practice through borrowed money, government grant and government loan respectively (Figure 4.2)

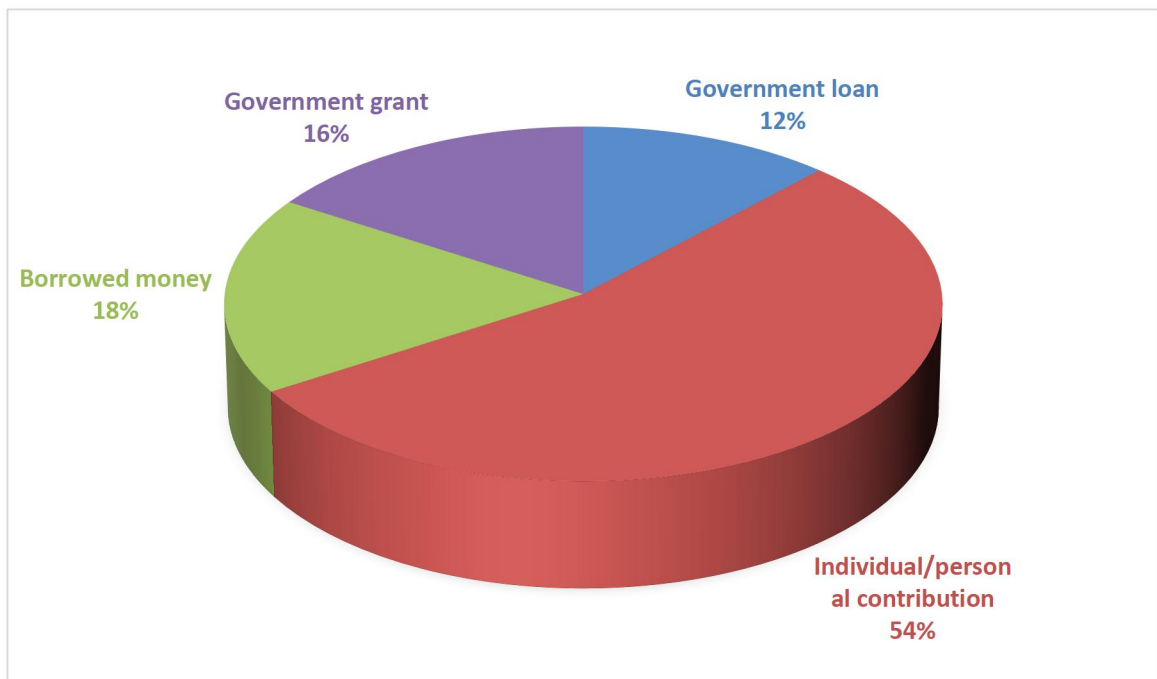


Figure 2: Sources of finance for taungya farming

The findings revealed that it is apparent that taungya farmers has no access to credit facilities, hence they depend on source of finance through individual and personal contribution. This study agreed with the Investigation by Hyman (2002) in his report on pulpwood production in the Philippines, who concluded that capital could be an impediment to investment in larger rotation timber species grown as cash crops.

The results of the selling price of the arable crops per annum are presented in Table 5. The results revealed significant difference ($P<0.05$) in selling price among the various arable crops under review.

The results also showed significant difference ($P<0.05$) in selling price of the arable crops among the locations under review. The selling price of yam differed significantly ($P<0.05$) from the selling price of other arable crops under review, while the selling prices of the arable crops in Ovia north east local government area dominated every other location considered for this study.

Table 5: Income from arable crops per annum (₦'000)

Locations	Maize	Vegetables	Yam	Plantain	Cassava	Mean
Ovia N. E.	100	50	260	80	120	122.0^a
Etsako W.	78	35	220	60	100	98.6^c
Uhunmwuonde	80	40	250	70	110	110.0^{bc}
Esan N. E	70	30	230	40	105	95.0^c
Orhiomwon	90	45	250	65	110	112.0^b
Ikpoba-Okha	98	50	255	75	115	118.6^{ab}
Mean	86.0^c	41.6^e	244.2^a	65.0^d	110.0^b	

Source: Field survey, 2022

The findings indicate a higher value of income generated from the sales of yam in all the study locations ranging from ₦255 – ₦260 while cassava and maize had a slightly higher price with a significant lower selling price among vegetable and plantain in all the study locations. This observation could be attributed to the growing demand of the commodity in the study area. Thus, this agrees with the report of Chukwuebuka *et al* (1990) who stipulated in their study that the important criteria for taungya farmers to grow crops alongside with tree species depend on demand for the produce and ready market outlets and prices of the products which tree growing is profitable.

The results revealed significant difference ($P<0.05$) in cost price among the various arable crops reviewed, and also among the locations under review. The cost price of yam dominated the cost price of other arable crops reviewed, while the cost price of the arable crops in Ovia north east local government area dominated every other location considered in this study.

Table 6: Cost of arable crops per annum (₦'000)

Locations	Maize	Vegetables	Yam	Plantain	Cassava	Mean
Ovia N. E.	45	24	120	35	60	56.8^a
Etsako W.	36	17	110	30	45	47.6^c
Uhunmwuonde	40	20	120	35	50	53.0^{ab}
Esan N. E	35	15	112	20	50	46.4^c
Orhiomwon	50	22	115	30	45	52.4^b
Ikpoba-Okha	48	24	120	30	57	55.8^a
Mean	42.3^c	20.3^c	116.2^a	30.0^d	51.2^b	

Source: Field survey, 2022

The findings of this study are in line with the report made by Agwu and Abah (2000) who noted that farmer's show positive attitude towards demand for land tenure use practices that hold great benefits. This implies that high demand for a farm produce influenced the output of the products. Which has strong correlation with their price in the study area.

The results revealed significant difference ($P < 0.05$) between the selling price and cost price of the arable crops reviewed. The selling prices dominated the cost prices of the arable crops in taungya practices (Table 7)

Table 7: Profitability of the arable crops in taungya practice (₦'000)

Arable crops	Selling price	Cost price
Maize	86.0	42.3
Vegetables	41.6	20.3
Yam	244.2	116.2
Plantain	65.0	30.0
Cassava	110.0	51.2
Mean	109.4^a	52.0^b

Source: Field survey, 2022

The findings revealed that profitability of the arable crops by the farmers was influenced by the selling price of the commodity, this was observed among the various crops. Though the selling price and cost price for maize, yam and cassava was higher significantly. This was attributed to the cost of production for maize, yam and cassava which might have influenced the profitability of the produce by the farmers.

The results revealed significant difference ($P < 0.05$) in yield per hectare among the arable crops reviewed.

The results also revealed significant difference ($P<0.05$) in yield of the arable crops among the 3 years allowed for the taungya practice. The yield accruable to yam dominated the yield of other arable crops, while the yield of arable crops obtained in the first year differed significantly ($P<0.05$) from yields of other years (Table 8).

Table 8: Yield of arable crops per hectare in Taungya practice (tons)

Year	Maize	Vegetables	Yam	Cassava	Mean
1 st	7.0	3.8	14.0	11.0	9.0^a
2 nd	5.0	3.2	11.5	9.0	7.2^{ab}
3 rd	3.5	2.3	8.0	7.5	5.3^b
Mean	5.2^b	3.1^b	11.2^a	9.2^a	

Source: Field Survey, 2022

This implied that farmers in the study area obtained more yield from farming yam, cassava and maize. The study further identifies higher yield in yam production from first to third year, with slight increase in cassava and maize while the lowest yield is available to vegetable. This higher yield was attributed to the level of demand coupled with other factors like labour cost of the produce. These findings disagreed with the view expressed by Deininger (2003) who reported that majority of the farmers interviewed who engaged in small scale farming and cultivated crops with short gestation period are more likely to obtain higher yield of produce for export and foreign exchange.

The results revealed inadequate monitoring (36%) as the major problem mitigating taungya practice in the study area. This was followed by limited duration for land use/rent (24%), no government incentive (20%), and inadequate man power (18%). While the least problem mitigating the practice in the study area was lack of extension education (2%).

Table 9: Problems mitigating the taungya practices in the study area

Variables	Frequency	Percentage
Inadequate monitoring	45	36
Duration for land use/rent is limited	30	24
No incentive from government	25	20
Inadequate man power	22	18
Lack of extension education	5	2
Total	124	100

Source: Field Survey, 2022

Inadequate monitoring, duration for land use/rent, lack of incentive from government and inadequate manpower as a major problem mitigating taungya practice in the study area, though substantial majority of the farmers lay more emphasis on inadequate monitoring of the farming practice to encourage land tenure taungya practices in the study area. This limitation could be attributed to the fact that most of the farmers manage the allocated plot themselves. The findings of this study were not different from the study carried out by Madukwe (2004) who stated that limited government responsiveness to

taungya practices and programme lead to poor knowledge and lack of proper awareness and access to adequate facility.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Taungya farming practices plays a vital role to the majority of farmers in the study area. Most of the farmers prefer a government rental system for farming, the allocated period of time given for taungya practices ranges between four to six years duration on a given plot of land. The highest plot of land allocated for taungya farming fall between two to four hectare per a given period of time. thus, the land rate per hectare from the year 2000 to 2022 ranges between seventy thousand five hundred to ten thousand naira with the stipulated period of farming season, however the major source for financing the taungya farming was as a result of individual/personal contribution. The farming of yam, cassava and maize is major profitable arable crops derived from the farming system. Despite the profitability measure and yield from the farming system.

5.2 Recommendations

Based on the findings of the study the following are recommended for future utilization;

1. The government should encourage the farmers by providing adequate supply of farmland to accommodate a large portion of land.
2. Government and financial institution should provide soft loans for the farmers.
3. This is against the principle of taungya establishment.

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APPENDIX
QUESTIONNAIRE

DEPARTMENT OF FOREST RESOURCES AND LAND MANAGEMENT
FACULTY OF AGRICULTURE
UNIVERSITY OF BENIN, BENIN CITY

TOPIC: EVALUATION OF LAND TENURE OF TAUNGYA FARM IN EDO STATE, NIGERIA

Dear Respondent,

Land Tenure in any society regulates behavior and define how property right to land is to be allocated. If guarantees how access is granted in terms of right to use, control and transfer land as well as associated responsibilities and restraints.

Please answer the following questions. Your response will be treated with utmost confidentiality.

1. Are you a practitioner taungya farmer? (a) Yes [] (b) No []
2. If yes, please state the Local Government Area
3. Where is your farm located?
 - (a) Within a community land []
 - (b) Within a personal land []
 - (c) Within a rented land []
 - (d) Within a government reserve []
 - (e) Others. Please specify
4. What kind of Land Tenure do you practice
 - (a) Customary land tenure []
 - (b) Private ownership []
 - (c) Traditional land tenure []
 - (d) Tenancy and state ownership []
 - (e) Individual land tenure []
 - (f) Communal land tenure []
 - (g) Others. Please state.....
5. How long do you remain on a given piece of land allocated to you?
 - (a) Less than 5 years []
 - (b) 5-10 years []
 - (c) 12-15 years []

- (d) 15-20 years []
 (e) Above 20 years []
6. What is the size of your farm
 (a) <2 ha []
 (b) 2-4 ha []
 (c) 5-7 ha []
 (d) >7 ha []
7. Do you pay per hectare annually?
 (a) Yes []
 (b) No []
8. If yes please state the price per hectare?
9. Where do you get money to engage in taungya practice?
 (a) Government loans []
 (b) Individual/personal contribution []
 (c) Borrowed money []
 (d) Others (Specify)
10. What is the selling price (benefits) of arable crops in taungya in a year?
- | Arable crops | Selling price (#) |
|---------------|-------------------|
| (a) Maize | |
| (b) Vegetable | |
| (c) Yam | |
| (d) Plantain | |
| (e) Cassava | |
11. What is the cost of producing arable crops in taungya in a year?
- | Arable crops | Cost (#) |
|---------------|----------|
| (f) Maize | |
| (g) Vegetable | |
| (h) Yam | |
| (i) Plantain | |
| (j) Cassava | |
12. How much profit do you make from your farm in a year?
 (a) <10% []
 (b) 10-30 []
 (c) 31-50 []
 (d) 51-70 []
 (e) 71-90 []
 (f) >90 []
13. What are the problems mitigating the practices?

- (a) Inadequate monitoring []
- (b) Duration for land use or rent is limited []
- (c) No incentives from both government and individual []
- (d) Inadequate man power []
- (e) Duration of time for planting is only temporary []
- (f) Others (specify).....

ANALYSIS OF VARIANCES FOR LOCATION OF RESPONDENT'S FARM LAND

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	6	38	6.333333	3.866667
Column 2	6	21	3.5	1.9
Column 3	6	64	10.66667	10.66667

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	156.3333	2	78.16667	14.26978	0.000338	3.68232
Within Groups	82.16667	15	5.477778			
Total	238.5	17				

ANALYSIS OF VARIANCES FOR PERIOD SPENT ON A GIVEN PLOTS OF LAND FOR TAUNGYA FARMING (YRS.)

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	6	42	7	8
Column 2	6	66	11	9.6
Column 3	6	16	2.666667	0.666667

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	208.4444	2	104.2222	17.11679	0.000135	3.68232
Within Groups	91.33333	15	6.088889			
Total	299.7778	17				

ANALYSIS OF VARIANCES FOR LAND RATE PER HECTARE IN EDO STATE (₦)

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	6	10500	1750	175000
Column 2	6	14000	2333.333	66666.6
Column 3	6	14500	2416.667	41666.6
Column 4	6	26000	4333.333	1066667
Column 5	6	33500	5583.333	441666.
Column 6	6	53500	8916.667	3041667

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	2.21E+08	5	44211111	54.8827	3.42E-14	2.53355
Within Groups	2416666	30	805555.6			
Total	2.45E+08	35				

ANALYSIS OF VARIANCES FOR INCOME FROM ARABLE CROPS PER ANNUM (₦'000)

Anova: Two-Factor Without Replication

<i>SUMMARY</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Row 1	5	610	122	6620
Row 2	5	493	98.6	5174.8
Row 3	5	550	110	6750
Row 4	5	475	95	6550
Row 5	5	560	112	6557.5
Row 6	5	593	118.6	6412.3
Column 1	6	516	86	142.4
			41.6666	66.6666
Column 2	6	250	7	7
		146	244.166	244.166
Column 3	6	5	7	7
Column 4	6	390	65	200
Column 5	6	660	110	50

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	2872.56	7	574.513	17.8531	9.12E-07	2.71089
Columns	151614.	8	37903.7	1177.86	2E-23	2.86608
Error	643.6	4	32.18	5		1
Total	155131	20				

**ANALYSIS OF VARIANCES FOR COST OF ARABLE CROPS PER ANNUM
(₹000)**

Anova: Two-Factor Without Replication

<i>SUMMARY</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Row 1	5	284	56.8	1423.7
Row 2	5	238	47.6	1320.3
Row 3	5	265	53	1520
Row 4	5	232	46.4	1532.3
Row 5	5	262	52.4	1351.3
Row 6	5	279	55.8	1465.2
			42.3333	39.4666
Column 1	6	254	3	7
			20.3333	13.8666
Column 2	6	122	3	7
			116.166	20.1666
Column 3	6	697	7	7
Column 4	6	180	30	30
			51.1666	38.1666
Column 5	6	307	7	7

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	446.8	5	89.36	6.83354	0.00072	
Columns	34189.6	4	8547.41	653.638	6.94E-	2.86608
Error	261.533	20	13.0766	8	21	1
Total	34898	29				

T' TEST FOR PROFITABILITY OF THE ARABLE CROPS IN TAUNGYA PRACTICE (₹'000)

t-Test: Two-Sample Assuming Unequal Variances

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	109.36	52
Variance	6321.788	1426.315
Observations	5	5
Hypothesized Mean Difference	0	
df	6	
t Stat	2.457124	
P(T<=t) one-tail	0.097673	
t Critical one-tail	1.94318	
P(T<=t) two-tail	0.195345	
t Critical two-tail	2.446912	

ANALYSIS OF VARIANCES FOR YIELD OF ARABLE CROPS PER HECTARE IN TAUNGYA PRACTICE (tons)

Anova: Two-Factor Without Replication

<i>SUMMARY</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Row 1	4	35.8	8.95	20.01
Row 2	4	28.7	7.175	14.18917
Row 3	4	21.3	5.325	8.1225
Column 1	3	15.5	5.166667	3.083333
Column 2	3	9.3	3.1	0.57
Column 3	3	33.5	11.16667	9.083333
Column 4	3	27.5	9.166667	3.083333

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	26.285	2	13.1425	14.72549	0.004848	5.143253
Columns	121.61	3	40.53667	45.41923	0.000162	4.757063

Error	5.355	6	0.8925
Total	153.25	11	
