

ATTITUDE OF COOPERATIVE RURAL FARMERS TOWARDS JATROPHA PRODUCTION IN SELECTED LOCAL GOVERNMENT AREAS OF OGUN STATE, NIGERIA

¹ Osunmakinde, Aanu Mathew and ²Ogunseitan, Taiwo Olusola

¹Department of Agricultural Extension and Management School, Federal Polytechnics Ilaro, Ogun-State, Nigeria.

²Department of Agricultural Extension and Management School, Federal Polytechnics Ilaro, Ogun-State, Nigeria.

G mail: ¹aanu.osunmakinde@federalpolyilaro.edu.ng,

²taiwo.ogunseyitan@federalpolyilaro.edu.ng

Corresponding Author: Osunmakinde, Aanu. M., +2348035112443;

aanu.osunmakinde@federalpolyilaro.edu.ng

ABSTRACT

The study investigated cooperative rural farmers' disposition towards Jatropha cultivation in selected local government areas of Ogun State. A Multistage sampling method was employed to select areas with available Jatropha farmers, and 180 respondents were chosen using a simple random sampling technique. Data collection was conducted through a well-structured questionnaire, inclusive of an interview segment, and analysis was carried out utilizing descriptive statistics as well as Pearson's product-moment correlation. Results indicated that a significant majority (82.2%) of Jatropha farmers were males, married (63.3%), with households comprising 4-6 members (71.1%). Additionally, 67.2% were Christians, and 56.1% of farmers were within the active age bracket (40 years and below). The outcomes further revealed that most respondents concurred on Jatropha's potential as a renewable energy source, recognizing its seeds as a viable alternative to synthetic fertilizers for soil enrichment. The findings established a positive correlation between farmers' attitudes towards Jatropha production and the perceived benefits, indicating a correlation coefficient of 0.22 with a statistically significant p-value of 0.003 at the 0.01 significance level. Moreover, a correlation was observed between farmers' attitudes towards Jatropha production and their awareness levels regarding the same, yielding a correlation coefficient of 0.14 with a non-significant p-value of 0.06 at the 0.05 significance level. The implications of this study underscore the importance of fostering a positive attitude among farmers towards Jatropha cultivation. Consequently, governments should be involved in facilitating continuous communication efforts emphasizing the significance of Jatropha production for farmers.

Keywords: Attitude, Farmers, Jatropha, Production, Ogun-State

INTRODUCTION

Jatropha (*Jatropha curcas*), an oilseed legume, has attracted significant attention as a potential source of biodiesel. Given the global concerns surrounding energy security and environmental sustainability, there is an increasing demand for biodiesel production (Neupane et al., 2021). Jatropha (*Jatropha curcas*), also known as Remedial nut, is a versatile plant in the Euphorbia plant family, distinguished by its oil-bearing kernels and ability to reach heights of up to 6 meters. This species naturally thrives in tropical and subtropical regions of the Northern Hemisphere,

predominantly in developing countries of the Eastern Hemisphere (Sine et al., 2020). During the Second World War, the Malagasy Republic, Republic of Benin, and Republic of Cape Verde successfully substituted jatropha for diesel fuel (Brittaine, Lutaladio, Jatropha, 2010). Beyond its culinary applications, plant oils serve as valuable and sustainable resources for energy and industrial purposes (Dyer and Mullen, 2008). The recent surge in the utilization of vegetable oils for bio-based diesel alternatives can be attributed to various factors, including the escalating value of oil, the drive to mitigate carbon dioxide emissions, and the need for a reliable energy supply. Simultaneously, there is a growing demand for resources such as land and water to sustain the expanding global population. Globally, renewables account for 13% of the energy mix, with bio-based energy contributing approximately ten percent (Ho, Ngo, and Guo, 2014). Sustainable transportation fuels like biodiesel and bioethanol dominate bio-based energy production, representing almost half of global hydrocarbon consumption and a quarter of the energy sector's carbon dioxide (CO₂) emissions (International Energy Agency, 2010). Promising options for biodiesel production encompass oils from vegetable sources, soybean lipids, Helianthus oil, brassica oil, and oilseed oil, all of which are naturally replenished, environmentally friendly, widely accessible, and cost-effective sources of fatty acids derived from oils unsuitable for human consumption, tallow, byproducts obtained from vegetable oil refinement, and recycling of food waste. The Jatropha plant is a five-meter-tall woody shrub with an average lifespan of fifty years. Its leaves turn yellow and fall during the dry season, only to regrow during the rainy season. Known as "jarak pagar"(with "pagar" meaning boundary), the species is commonly used to deter crop-damaging animals from accessing farms and gardens. In Indonesia, particularly Java, the species is utilized as a disinfectant, lesion treatment, and gum hemorrhage rinse, while its seeds serve as an effective laxative. Evolving to thrive in arid environments and poor soil conditions, Jatropha plants excel in dryland areas characterized by high temperatures and limited soil moisture. Due to its ability to flourish in alkaline, salt-affected soils, as well as regions with scarce water resources and energy requirements, there is a growing interest in cultivating Jatropha as a potential bioenergy crop in countries lacking oil production capacities (Sine, Ouattara, Sambakhé, Ngom, Ndiaye Jatropha, 2020). Nigeria, as a developing economy with increasing energy demands, has shown interest in exploring alternative energy sources such as jatropha (Arun et al., 2014). Jatropha curcas Linnaeus, commonly referred to as Jatropha, is a vital biodiesel commodity cultivated in various regions worldwide, including Nigeria, due to its adaptability to diverse agro-climatic

conditions. With its role in biodiesel production, soil stabilization, and other domestic applications such as fertilizer manufacturing, soap production, and pharmaceuticals, the global potential of this crop is on the rise (Khan, *et al.*, 2022). (Atanda *et al.*, 2018) Described that cooperatives are established by individuals with shared interests pooling their resources to create a collectively owned business enterprise. Financial institutions catering to the needs of low-income households in rural areas are essential. These areas are often underserved by formal financial entities due to the high costs and risks associated with providing financial services to predominantly small-scale rural clients who lack collateral and rely on unpredictable agricultural incomes. The primary challenge to income growth in both agricultural and non-agricultural sectors, where many low-income households reside, is financial in nature. Inadequate financing of agricultural production and limited exploitation of economic opportunities stem from low savings or their near absence. Low-income households require financial services that aid in raising capital for investments, acquiring lump sums, and increasing their savings propensity. The insufficient investments typical of impoverished households can be attributed to a deficient financial sector that overlooks the needs of the indigent. At the farm level, the lack of finance hampers farmers' ability to clear land, implement irrigation, procure inputs like fertilizers and seeds, cover machinery costs, manage storage, bridge income gaps before harvest, smooth seasonal income fluctuations, and hedge against yield price fluctuations. Despite the availability of microfinancial assistance, the desired impact has not been fully realized. Cooperative Society is defined as an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise. Cooperative Thrift and Credit Societies (CTCSs) are legal organizations established and regulated by the respective laws of a given country. Thrift and Credit Societies are member-based organizations that help members to address economic problems. They are not banking institutions because of their goal. The ultimate goal is to encourage thrift among the members and to meet credit needs of people who might otherwise fall prey to loan sharks and other predatory lenders (Akerle and Adekunmbi, 2018). A credit cooperative is also a service cooperative, and allows members to jointly finance their investments or working capital (Agada *et al.*, 2018). Through credit unions, members' pool funds to be loaned to members and at the same time loans can be raised at better interest rates than those offered by commercial banks their production activities.

Statement of Problem

Due to its capacity to thrive on arid and infertile land, jatropha cultivation as a potential biodiesel commodity has garnered significant attention in Nigeria. The degradation of the environment is a result of the excessive utilization of energy in human activities. When nature loses its value or is degraded, ecosystem disruption occurs, encompassing various forms such as environmental devastation, wildlife depletion, and ecological system destruction, as evidenced by land degradation through erosion, flooding, tree removal, and land deterioration. Moreover, human activities like the application of chemical inputs in agriculture have adverse effects on the climate, ecosystem, and biodiversity. Jatropha plays a crucial role in enhancing soil productivity (Khan *et al.*, 2022) by mitigating wind and precipitation erosion and enhancing the soil's moisture retention capacity (Yammama, 2009). Jatropha crops are cultivated to combat soil degradation caused by water and wind forces. Jatropha is employed for land restoration and conservation by establishing plantations on unproductive soil, enclosures, sloping land, and valleys; its robust root structure aids in binding soil minerals to prevent degradation (Karavina *et al.*, 2011). In recent years, the Nigerian environment has been plagued by land degradation in the southwestern region, aridification and encroachment in the southwest, low rainfall in the northern part, and flooding in the southwestern, North-inland, and other regions. The lack of environmental sustainability in this region may be attributed to the ignorance and inadequate approach of the general populace towards the necessary corrective measures for ensuring a safe and habitable environment for humans, plants, animals, and wildlife. Thus, cultivating jatropha could offer a viable solution of utmost importance for ecological revitalization, despite the lack of awareness among many rural residents. In Nigeria and other developing nations globally, the involvement of Ogun State farmers in jatropha production has become imperative. Ostwald *et al.*, (2011) advocate for jatropha as a water-efficient plant with rapid growth capabilities on degraded land, presenting environmental benefits. However, the successful incorporation of jatropha cultivation into the agricultural landscape and broader energy sector hinges on producers' attitudes towards this crop. Farmers' attitudes, comprising their beliefs, perceptions, and opinions, are pivotal in determining their engagement in jatropha cultivation. To align agricultural practices with renewable energy goals and promote sustainable development, it is essential to study producers' perspectives on jatropha production. As a growing economy with increasing energy demands, Nigeria seeks to diversify its energy sources and reduce reliance on non-renewable energy. Jatropha holds significant potential as a sustainable energy source, yet integrating it into the agricultural and energy sectors

necessitates an understanding of producers' attitudes. Comprehending farmers' views on jatropha as a biofuel commodity and their inclination to adopt it can aid in formulating policies and strategies that reconcile economic progress with environmental sustainability and food security.

Objectives of the Study

The broad objective is to evaluate attitude of cooperative rural farmers towards Jatropha production in the study area. The specific objectives are to; describe the socio-economics attributes of the farmers involved in the production of jatropha, determine the level of awareness among farmers regarding the environmental benefits of jatropha cultivation and ascertain the motivating factors enhancing farmers' decision for jatropha production in the study areas.

LITERATURE REVIEW

Jatropha Production

The etymology of the genus name Jatropha can be traced back to Greek roots, where ‘‘jatos’’ denotes doctor and ‘‘trophe’’ signifies food, alluding to its medicinal attributes. Jatropha curcas stands out as the most commonly acknowledged species, notwithstanding the existence of approximately 170 identified species within the genus (Alabi *et al.*, 2021). Belonging to the **Euphorbiaceae family**, Jatropha curcas originates from Central America but has proliferated to West and Central Africa (Alabi *et al.*, 2021). This plant's multifaceted applications and promising prospects render it a valuable asset (Alabi *et al.*, 2021). The propagation of Jatropha curcas is relatively straightforward through cuttings and is frequently utilized as a hedge to mitigate soil erosion. This plant is a hardy, oil-seed producing shrub or diminutive tree, exhibiting resilience to drought conditions (Jongschaap *et al.*, 2007). It thrives in impoverished soil and adverse climates. In Nigeria, Jatropha curcas prevails as the most prevalent species, while various regions and countries assign distinct names to the plant. Local appellations in Nigeria encompass ‘Binidazugu’ (Hausa), ‘wuluidi (Igbo), and ‘lapalapa’ (Yoruba) (Blench, 2003). Jatropha is believed to have been introduced to Africa and Asia by Portuguese seafarers from Central America and Mexico (Gunawan, 2018). The capacity of Jatropha to substitute petroleum fuel has been recognized for decades, with a historical precedent of usage as a diesel substitute in Madagascar, Benin, and Cape Verde during World War II. Jatropha, a succulent shrub or diminutive tree, can attain heights of up to 5 meters contingent on environmental conditions. Its seedlings develop a central taproot,

lateral roots, and secondary roots. Leaves arranged alternately on the stem exhibit shallow lobes of varying sizes (6-15cm) and shapes across diverse varieties. The plant contains white latex in its hollow stems and branches composed of soft wood of marginal value. Male and female flowers coexist on the same *Jatropha* plant, a characteristic of monoecy that relies on insects for pollination (Raju and Ezradanum, 2002). The male-to-female flower ratio averages 29:1 (Khan *et al.*, 2022), but diminishes with age, indicating heightened fruiting capacity. A single inflorescence yields 10+ fruits that are ellipsoidal, initially green and transitioning to brown with maturity. The fruits ripen 90 days post-flowering, encompassing 2-3 black seeds (2cm x 1 cm) with 35% non-edible oil content (Jongschaap *et al.*, 2007). *Jatropha* germinates swiftly from seed or stem cuttings, reaching a height of 1 meter and flowering within five months. *Jatropha* attains maturity in 4-5 years, with rapid vegetative growth occurring during rainy seasons and flowering instigated by precipitation. *Jatropha* trees can endure for 30-50 years or more (Henning, 2008). Moreover, *Jatropha* has been found to absorb 23% of carbon dioxide annually from the atmosphere, underscoring its significance as a valuable crop for environmental advantages (Belewu and Akande, 2010). In conclusion, *Jatropha* emerges as a valuable plant with a myriad of applications ranging from medicinal and pest control purposes to environmental benefits and industrial utilities. Its versatility and potential position it as a pivotal crop for sustainable development.

Farmers' Attitudes towards *Jatropha* Production

The cultivation of *Jatropha*, an increasingly significant agricultural endeavor, has garnered considerable attention among rural households in Nigeria and other developing nations. *Jatropha*, renowned for its capacity to withstand arid conditions and thrive in degraded land, is advocated as a plant with immense potential for ecological benefits (Ostwald *et al.*, 2011). However, the attitudes and perceptions of farmers towards *Jatropha* production play a crucial role in determining its adoption and success. One pivotal factor influencing the uptake of *Jatropha* among farmers is their level of awareness and comprehension of this crop. Inadequate knowledge regarding *Jatropha*'s productivity, compatibility with existing agricultural crops, and its contribution to rural livelihoods poses a significant constraint to its widespread utilization.

Empirical Review

Gunawan (2018) assessed the viability of *Jatropha curcas* as an alternative energy source for rural households in South Africa. The researchers highlighted the potential of *Jatropha* in diversifying

rural incomes, reclaiming unproductive lands, reducing fossil fuel imports, and mitigating greenhouse gas accumulation. Employing a cost-benefit analysis, the study compared Jatropha's feasibility as a biodiesel feedstock to other crops in Kwale district. The findings revealed an Internal Rate of Return (IRR) of 11 percent, a Benefit-Cost Ratio (BCR) of 0.62, and a Net Present Value (NPV) of -28,267.56. These results indicated that, during the study period, Jatropha production was not economically viable. However, the authors concluded that Jatropha still harbors potential for fulfilling its objectives under specific conditions. They underscored the necessity of synchronized research and development efforts across the Jatropha value chain, as well as the provision of technical and financial assistance to stakeholders involved in the production segment of the chain.

METHODOLOGY

Area of Study

This research was conducted in five local government areas namely; Abeokuta-North, Sagamu, Odogbolu, Yewa-North, and Yewa South in Ogun State, Nigeria. Situated within latitude 70 N and 70 5/N, and longitude 30 3/E and 30 37/W, Ogun State spans a total land area of 16,409.26 km². Bordered by Oyo and Osun States to the north, Ondo State to the east, Lagos State and the Atlantic Ocean to the south, and sharing an international border with Benin Republic, Ogun State has Abeokuta as its capital. The estimated population of Ogun State, as reported by the National Population Commission, stands at 3,751,140, comprising 1,864,907 males and 1,886,233 females. With twenty Local Government Areas in Ogun State, the selected five areas represent 25% of the total local government areas due to the cultivation of the plant in these study areas.

The selected Local Government Areas are justified due to their geographical spread and prevalence of Jatropha cultivation. These areas provide a representative sample for exploring farmers' attitudes towards Jatropha production in Ogun State, Nigeria.

Materials and Method of data collection

Both primary and secondary data were utilized for the study. The primary data was gathered through a well-structured questionnaire distributed to the selected Jatropha planters (farmers) in

the study area. The secondary data was acquired from online sources, published journals, academic books, dissertations, theses, and other pertinent publications.

The data was analyzed using comprehensive descriptive and inferential statistical analyses. Descriptive statistics, such as frequency distribution and percentage, were employed to delineate the socio-economic characteristics of jatropha farmers in Ogun State. This was assessed using attitude statements that encompassed the farmers' perspectives on jatropha production, rated on a 5-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1). The Jatropha inferential statistics includes Pearson Product Moment Correlation Coefficient (PPMC).

A Multistage sampling technique was employed to ascertain respondents for the study. Initially, a simple random sampling technique selection process was undertaken to choose five (5) local government areas renowned for their jatropha production in Ogun State, Nigeria. The chosen local government areas include Abeokuta-North, Sagamu, Odogbolu, Yewa North, and Yewa South. Subsequently, a random selection was conducted to pick four (4) towns within each of the aforementioned local government areas. Finally, nine (9) Jatropha farmers were randomly chosen from each of the selected towns, resulting in a total of 180 respondents for the study.

RESULTS AND DISCUSSIONS

Socio-economic characteristics of respondents

Classification of the Jatropha farmers based on age difference revealed that the largest percentage (35.60%) fell within the 30-40 age bracket, followed by 22.80% within the 41-50 age range. This outcome signifies that Jatropha farming is predominantly carried out by middle-aged individuals, with the majority falling within the economically active age group, indicating a promising outlook for the sustainability of Jatropha production. This demographic profile unveils the active involvement of young individuals in Jatropha farming, ensuring a lively and vigorous workforce.

The distribution of Jatropha farmers based on gender disparity revealed that 82.20% were male and 17.80% were female. The data suggests that farming activities in the study area are predominantly led by males, indicating a gender imbalance in agricultural operations.

This observation implies that farming tasks are inherently laborious and demand significant strength and energy, aligning with the findings of Mohammed and Abdulquadri (2012) that

64.17% of men in the study area undertake various responsibilities such as land management, bush clearing, crop cultivation, and animal husbandry, while 35.83% of women are primarily engaged in crop cultivation and other field operations. The analysis of *Jatropha* farmers' marital status revealed that a significant majority (63.30%) were married, indicating a strong presence of married individuals in *Jatropha* farming. Additionally, a notable minority (36.70%) were single, suggesting a substantial number of unmarried individuals also participated in *Jatropha* cultivation.

This distribution implies that married farmers may benefit from support from their spouses, potentially enhancing their farming activities. This finding resonates with the research of Elizabeth and Ana (2014), which emphasizes the interconnectedness of family and farm, combining economic, environmental, and social functions. The survey indicated that a significant majority of respondents (67.20%) identified as Christians, while a notable minority (26.70%) identified as Muslims. This suggests a substantial Christian presence in the study area, with Muslims also representing a significant portion of the population. The implication is that the findings may not be generalizable to regions or populations with different religious compositions, thereby limiting the scope of the conclusions drawn.

The classification of farmers based on educational attainment revealed that 47.20% had secondary education, while 17.80% attended tertiary institutions. This indicates that the majority of *Jatropha* farmers have completed primary education, significantly influencing their capacity to access, understand, and adopt new agricultural innovations and practices. Higher educational qualifications enhance farmers' ability to access information from diverse sources, interpret available data, and comprehend essential information on climate change in *Jatropha* production, accessibility, comprehension, and adoption of new agricultural practices. The family size of *Jatropha* cultivators showed that the majority (71.10%) had between 4-6 household members, while 16.70% reported 1-3 members. The findings indicate that family labor is adequate for *Jatropha* production in the study area, supporting the earlier research by Blessing and Goodness (2015), which established that larger household sizes serve as a proxy for labour availability, mitigating labor constraints. Similarly, this study suggests that the availability of family labour can effectively support *Jatropha* production activities, emphasizing the critical role of household size in ensuring labour availability and reducing related constraints. 57.70% of respondents sought labour through hiring, while 21.70% utilized their family members.

This suggests that a significant proportion of farmers rely on hired labor to support their production activities, leading to additional production costs. The majority of Jatropha farmers (62.20%) had accumulated significant experience in cultivation, with 1-5 years of experience being the most common, followed by 6-10 years (25.60%). Additionally, 5.60% had 11-15 years of experience, 4.40% had 16-20 years, and 2.20% have 21-25 years of experience. This indicates that respondents possess a profound understanding of Jatropha farming, acquired through extensive experience and exposure to various cultivation aspects. The results indicated that 50.0% of farmers inherited the land used for production, 21.70% rented the farmland, 21.10% purchased the land, and 7.20% were gifted the land. This suggests that farmers may face constraints related to land availability due to challenges in purchasing or renting sufficient land for production.

The results revealed that 51.10% of respondents cultivated 3-6 acres, 28.30% cultivated 7-10 acres, 13.40% cultivated 0.5-2.5 acres, and 7.20% cultivated 11-15 acres. This indicated that the majority of farmers in the study area are smallholders, Berdegue and Fuentealba (2011), as farms less than 2 hectares. Over three-quarters (73.40%) of farmers earned monthly incomes of less than or equal to ₦50,000, followed by ₦50,001-N100,000 (17.2%), with the least (9.40%) earned ₦100,001-₦250,000 per month. The high percentage of farmers earning low incomes suggests economic vulnerability, rendering them susceptible to poverty, food insecurity, and limited access to resources and services.

Table 1: Socio-Economic Characteristics of the Respondents

Variables	Frequency	Percentage
Age		
Less than 30years	37	20.5
30-40 years	64	35.6
41-50 years	41	22.8
51-60 years	34	18.9

60 years and above	4	2.2
Gender		
Male	148	82.2
Female	32	17.8
Marital status		
Single	66	36.7
Married	114	63.3
Religion		
Islam	48	26.7
Christianity	121	67.2
Others	11	6.1
Education		
Non formal	30	16.7
Primary	27	15.0
Secondary	85	47.2
Tertiary	32	17.8
Others	6	3.3
Household Size		
1-3 members	30	16.7
4-6 member	128	71.1
7 members and above	22	12.2
Source of labour		
Self	37	20.6
Family	39	21.7
Hired	104	57.7
Years of Jatropha farming experience		
1-5 years	112	62.2
6-10 years	46	25.6
11-15 years	10	5.6
16-20 years	8	4.4
21-25 years	4	2.2
Farmland Ownership		
Inherited	90	50.0

Purchase	38	21.1
Rent	39	21.7
Gift	13	7.2
Farmland Size		
0.5-2.5 acres	24	13.4
3-6 acres	92	51.1
7-10 acres	51	28.3
11-15 acres	13	7.2
Monthly income from Jatropha		
< ₦50000	132	73.4
₦ 50,001-₦100,000	31	7.2
₦100,001-₦250,000	17	9.4
Total	180	100

Source: Survey, 2024

Level of awareness among farmers (jatropha's farmers)

Result on Jatropha information source revealed that 42.80% sourced for information on Jatropha through social media, 24.40% sourced for information on Jatropha production by attending seminars, 18.30% of the farmers sourced for information through friends, 10.60% of the farmers got their information from extension agent while 3.90% sourced for information on Television. This implies that farmers have several alternative sources from which they can get information on Jatropha production, and this enhances Jatropha farmers' production since they can easily access information on Jatropha production (Emmanuel, Yusuf, Sheriff & Shehu, 2016).

Table 2: Level of awareness among farmers (jatropha farmers) N=180

Jatropha Information Source

Variables	Frequency	Percentages
Television	7	3.9

Social Media	77	42.8
Seminar	44	24.4
Friends	33	18.3
Extension Agent	19	10.6
Total	180	100

Source: Survey, 2024

Factors enhancing farmers’ attitude towards jatropha production attitude of farmers

Table 3, demonstrating a five-point Likert rating scale of Farmers' Attitudes, reveals that the majority (67.2%) of Jatropha growers affirmed the potential of Jatropha as a renewable energy crop. They acknowledge that Jatropha seeds present a promising organic substitute for synthetic fertilizers, aiding in the rejuvenation of depleted soils by harnessing their innate properties to enhance soil fertility. The belief that cultivating Jatropha could hold significant potential for socio-economic prosperity was shared by 68.9% of respondents. Moreover, the results indicate that participants agreed on the value of Jatropha production in combating wind erosion and desertification, attributing this to its adaptability to various soil types and its role in soil stabilization. The perceived ease of implementing Jatropha production practices was acknowledged by 66.1% of respondents. Additionally, opinions were expressed regarding the potential enhancement of agricultural landscape biodiversity through Jatropha farming (58.3%), as well as its viability in increasing farm income (53.3%). The findings further suggest that a majority of Jatropha cultivators view Jatropha cultivation as a promising venture for farmers in their region, foreseeing improved economic opportunities for the community (48.3%). Access to the necessary resources to initiate Jatropha farming was deemed crucial by 63.9% of respondents. Finally, a notable 47.8% expressed strong motivation to engage in training programs related to Jatropha cultivation. Collectively, these results indicate a positive attitude among Jatropha farmers towards Jatropha production.

Table 3: Factors enhancing farmers’ attitude towards jatropha production attitude of farmers

	SD	D	UD	A	SA
I believe Jatropha is a potential renewable energy crop	3(1.7)	121(67.2)	56(31.1)		
The seeds from Jatropha could serve					

as a good replacement

for inorganic fertilizer to replenish

infertile soils due to its organic nature 7(3.9) 3(1.7) 131(72.8) 39(21.7)

I believe cultivating Jatropha could be

germane potential for socio-economics 15(8.3) 10(5.6) 124(68.9) 31(17.2)

wellbeing.

Jatropha cultivation is useful for control

of wind erosion and desertification due

to its growth on all soil 7(3.9) 13(7.2) 73(40.6) 87(48.3)

Jatropha production practices are easy

to implement 8(4.4) 12(6.7) 119(66.1) 41(22.8)

Jatropha farming could enhance the

biodiversity of our agricultural land scape 12(6.7) 19(10.6) 105(58.3) 44(24.4)

Jatropha production is a viable option for

increasing farm income 28(15.6) 8(4.4) 96(53.3) 48(26.7)

Jatropha cultivation is a promising option

for farmers in our area 28(15.6) 4(2.2) 74(41.1) 74(41.1)

Jatropha cultivation could lead to better

economic opportunities for our

community 14(7.8) 2(1.1) 21(11.7) 87(48.3) 56(31.1)

Access to the necessary resources to

start Jatropha farming 7(3.9) 5(2.8) 115(63.9) 53(29.4)

Motivated to participate in training

programs related to Jatropha cultivation 13(7.2) 81(45.0) 86(47.8)

SD = Strongly disagreed, D= Disagreed, UD = Undecided, A= Agreed, SA= Strongly agreed

Source: Survey, 2024

Distribution of correlation between Attitude of Farmers and Farmers' Level of Awareness towards Jatropha Production

Correlation between the disposition of farmers towards Jatropha cultivation and the level of consciousness among farmers regarding Jatropha production was examined. The correlation coefficient calculated was 0.14 with a p-value of 0.06, indicating insignificance at the 0.05 level of significance. This suggests a favorable association between farmers' attitudes towards Jatropha cultivation and their awareness levels, albeit not statistically significant.

Table 4: Correlation between Attitude of Farmers and Farmers’ Level of Awareness towards Jatropha Production

		Attitude of farmers	Farmers Awareness
Attitude of farmers	Pearson Correlation	1	.141
	Sig. (2-tailed)		.060
	N	180	180
Farmers Awareness	Pearson Correlation	.141	1
	Sig. (2-tailed)	.060	
	N	180	180

Source: Survey, 2024

Distribution of Correlation between Attitude of Farmers and Jatropha’s Benefits

Table 5 illustrates the correlation between farmers' disposition towards Jatropha cultivation and the advantages derived from Jatropha. The correlation coefficient stands at 0.22, accompanied by a statistically significant p-value of 0.003, meeting the significance threshold of 0.01. This suggests a subtle yet positive link between farmers' attitudes towards Jatropha cultivation and the benefits reaped from Jatropha production.

Table 5: Correlation between Attitude of Farmers and Jatropha’s Benefits

		Attitude of farmers	Jatropha Benefits
Attitude of farmers	Pearson Correlation	1	.217**
	Sig. (2-tailed)		.003
	N	180	180
Jatropha Benefits	Pearson Correlation	.217**	1
	Sig. (2-tailed)	.003	
	N	180	180

Source: Survey, 2024

CONCLUSION AND RECOMMENDATIONS

The *Jatropha* cultivators revealed that the majority (82.2%) of the *jatropha* farmers were males, married (63.3%), and had a household size of 4-6 members (71.1%). Additionally, 67.2% identified as Christian, and over half (56.1%) of the farmers were in their prime working age (40 years and below). The third objective concerning the correlation between farmers' attitude towards *Jatropha* production and the benefits of *Jatropha* indicated a correlation coefficient of 0.22 with a significant p-value of 0.003 at the 0.01 level of significance. This suggests a weak positive relationship between farmers' attitude towards *Jatropha* production and its benefits. The correlation between farmers' attitude towards *Jatropha* production and their level of awareness regarding *Jatropha* production yielded a coefficient of 0.14 with a p-value of 0.06, which was not significant at the 0.05 level. This indicates a positive but insignificant relationship between farmers' attitude towards *Jatropha* production and their awareness of it. In conclusion, most farmers acknowledged having the appropriate behavior towards *Jatropha* production. They recognized *Jatropha* as a promising sustainable energy source with potential socio-economic benefits, emphasizing its organic properties as a natural alternative to synthetic fertilizers for soil revitalization. Factors such as access to reliable information, market availability for *Jatropha* products, and ease of obtaining seeds and inputs influenced farmers' attitudes towards *Jatropha* cultivation. Farmers displayed awareness of the environmental benefits of *Jatropha* cultivation, including soil fertility enhancement, erosion control, prevention of land degradation, nutrient retention in soils, and maintenance of fertile farmlands. Despite this, there was no discernible difference in farmers' attitudes towards *Jatropha* production across various local government areas. The study recommended the establishment of information centers in rural communities to provide tailored agricultural guidance to illiterate *jatropha* farmers and disseminate market information. It also suggested that extension agents should be assigned to educate farmers on the multiple benefits of *Jatropha* cultivation beyond environmental advantages and to enhance their environmental awareness. Furthermore, the government was urged to provide financial support through loans for *jatropha* farmers and ensure the availability of improved *Jatropha* seeds and pesticides.

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