



INTERNATIONAL JOURNAL OF PHYTOFUELS AND ALLIED SCIENCES
(A Journal of the Society for the Conservation of Phytofuels and Sciences)
(<http://www.phytofuelsciences.com>) (ISSN 2354 1784)

Analysis of Perception of Agricultural Extension Officers on Commercialization of Jatropha in Kwara State, Nigeria

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Abstract

The study assessed the level of awareness and perception of the economic potentials of the Jatropha plant among extension officers in Kwara State, Nigeria. Random sampling technique was employed to select 60 extension officers on which a structured questionnaire was administered. The questionnaire consisted of positively presented items on a five point Likert scale. Data collected were analyzed using descriptive statistics, correlation analysis and the linear regression analysis. The study revealed that 69 percent of the extension officers were aware of the economic potentials of the plant but only 29 percent had played any role in promoting its commercialization among farmers. About 57 percent held high and positive perceptions of the economic potentials of Jatropha commercialization among small-scale rural farmers. Age (-2.881) and educational level of the extension officers (3.621) influenced their perception of commercialization of Jatropha at $p < 0.01$. Unavailability of ready market and capital were indicated as major possible constraints to the commercialization of Jatropha cultivation. The study concluded that in spite of the high level of awareness of the economic potentials of commercialization of the Jatropha plant among extension officers, they play very little role in promoting its commercialization among farmers. Based on the findings of the study, there is a need for training to prepare extension officers for their expected roles in promoting commercialization of the plant. Farm credit should be made accessible to farmers in addition to assured market for the produce.

Keywords: Perception, Commercialization, Jatropha, Agricultural extension officer, Extension service delivery

Introduction

Hunger and undernourishment have continued to plague the world in spite of global resolutions to eradicate or at the least curb the surge. While one of every eight persons in the world is hungry, one in every four is the case in Africa with a two percent annual increase since 2007 (FAO, 2012). Hunger does not only trap the poor in poverty (Ahmed *et al.*, 2007), it is the number one cause of death in the world, killing more than HIV/AIDS, malaria, and tuberculosis combined (World Food Programme, 2014). UNICEF 2008 reported that 22,000 children die every day from hunger related issues while every undernourished child endures about 160 days of illness every year. Majority (98%) of the worlds hungry people are found in the developing countries, 75 percent of whom live in rural communities and are predominantly farm families (World Bank, 2008). Given the established

relationship between poverty and hunger, enhancing rural incomes becomes a major strategy to stemming the current violation of the right to food (Adepoju and Adejare, 2013). The maximization of potentials inherent in the commercialization of underutilized economic plants such as the jatropha can improve farmers' income and enhance rural livelihood.

The jatropha plant is a multipurpose, oil rich shrub or tree which is in principle non-edible. A flowering plant in the spurge family, Euphorbiaceae, the plant is found growing wild in most rural communities in Nigeria though native to Central America. The name jatropha is derived from the Greek word 'jatos' meaning a physician and 'trophe' meaning food. The efficacy of various parts of the Jatropha plant in the treatment of a wide range of ailments has been confirmed by scientific studies as well as at the level of the uneducated rural people (Igoli *et al.*, 2005; Omeh and Ezeja

2010). The plant has been associated with the management of Pile, ear ache, malaria, wounds, to stop bleeding, snake bite, paralysis, dropsy, diabetes mellitus, laxative in constipation and local contraceptives. Credited to have insecticidal abilities, household consumables such as candles, bar and liquid soaps, lubricants dyes etc have been made using various parts of the plant. Upon detoxification, it is also a source of highly nutritious and economic protein in animal feed as well as an excellent source of organic fertilizer for crops. It provides covering for shade loving plants, prevents soil erosion and serves as hedges for homes and farmlands. Current interest by investors, governments, farmers and Non Governmental Organizations (NGOs) in jatropha is mainly due to its potential as an energy crop. Jatropha seeds can be pressed into bio-oil that has good characteristics for direct combustion in compressed ignition engines or for the production of biodiesel (Becker and Makkar, 2009). The

facts that the plant can be intercropped with food crops, grows on marginal soils, grows fast and produces seeds over a 50 year period are some of the selling points of its commercialization (Brittaine and Lutaladio, 2010). In order to maximize the potentials of the plant, it is important that farmers have a good knowledge of the various opportunities inherent in the commercialization of the Jatropha in addition to adequate advisory services.

Agricultural extension, through its agencies and officers is directly responsible for the dissemination of agricultural information and the provision of agricultural advisory services. To be able to promote the commercialization of the Jatropha, extension officers must be aware and knowledgeable about the plant and its potentials. The perception of the extension personnel is also of immense significance to their service delivery as perception has been scientifically linked to adoption (Negatu and Parikh, 1999). It is not very likely that extension service

delivery will be effective in situations where the extension personnel hold negative perception of the subject matter. Knowledge of socio-economic characteristics of the extension personnel which influence their perception will assist in improving the perception of extension officers of commercialization of the Jatropha. The existence of some constraints that can militate against the successful commercialization of the plant cannot be ruled out. The general objective of the study is to analyze the perception of agricultural extension officers on the commercialization of jatropha. The specific objectives of the study are to;

1. assess the level of awareness of agricultural extension officers on the economic benefits of the jatropha plant;
2. assess the role played by the extension officers in promoting commercialization of jatropha among farmers;

3. examine the perception of the extension officers on commercialization of the plant and;
4. highlight constraints to the adoption of commercial jatropha cultivation among farmers

Two hypotheses were tested in the study as follows:

H₀₁: There is no correlation between the level of awareness of agricultural extension agents and role played in promoting the commercialization of Jatropha and;

H₀₂: Socio-economic characteristics of agricultural extension agents do not affect their perception of the commercialization of Jatropha

Methodology

The Study Area

The study was conducted in Kwara State, Nigeria. With 16 Local Government Areas and a population estimated at 2,371,089 (National Population Commission, 2006), the State lies between latitudes 7°45'N and 9°30'N and longitudes 2°30'E and 6°25'E.

The total land area of the State is put at 32,000 Km² (Kwara State Agricultural Development Project, KWADP, 2000). Daily temperature ranges between 21⁰C-33⁰C with an average annual rainfall of between 14995 and 15,000mm. There are two main climate seasons, the dry and wet seasons with an intervening cold and dry harmattan period usually experienced from December to January (KWADP, 2000). The natural vegetation consists broadly of rain forest, Guinea savannah in the extreme north with a Fadama belt along the River Niger. The vegetation of the State makes it suitable for the cultivation of several cash and food crops. Some of the food crops grown in the state include yam, cassava, sweet potato, sorghum, and cowpea. Kwara State has an estimated figure of 203,833 farm families with the majority living in rural areas (Kwara State Agricultural Development Project, KWADP 1996). The state is divided into four main agro-ecological zones (labeled A-D) in consonance with the ecological

characteristics, cultural practices and administrative convenience by the Kwara state Agricultural Development project. The KWADP is the primary agency responsible for agricultural extension services in the State.

Sampling Technique and Sample Size

The population for the study comprised of all agricultural extension personnel of the Kwara State ADP. Simple random sampling technique was employed in the selection of sixty (60) respondents from the list of one hundred and twelve (112) extension personnel in the state ADP.

Instrument for Data Collection and Analysis

Data used for the study were obtained by the use of a structured questionnaire. Descriptive statistics involving frequency counts and percentages were deployed to present the findings of the study. Correlation analysis and the multiple regression analysis were used to test the stated hypotheses of the study. The

variables in the study were measured as follows;

Awareness of economic benefits of the Jatropha- A list of 10 areas of economic importance was drawn and respondents were asked to indicate whether they were aware of them or not. A score of six out of ten was adopted as bench mark indicating awareness for any particular respondent.

Role played in promoting commercialization- Respondents were required to state whether or not they have promoted the commercialization of the plant in 10 different ways listed in the questionnaire. Six out of ten was adopted to indicate that the respondent had played a significant role.

Perception on commercialization- This was measured using a five point Likert scale. Respondents were asked to indicate the extent to which they agree or disagree with relevant statements depicting their perception on commercialization of the Jatropha plant. The mean of the scores of individual respondents was adopted as the

strength of their positive perception on the subject (Likert, 1932). The scale was graduated as follows;

Strongly disagree 5, Disagree 4, Indifferent 3, Agree 4 and Strongly agree 5.

Constraints to the commercialization of Jatropha- A list of possible constraints was drawn existing body of knowledge on the constraints to the commercialization of underutilized plant species. Respondents were required to rate the constraints based on their severity on a three point Likert-type scale graduated as follows;

Very severe = 1, moderately severe = 2, not severe = 3.

The scores obtained on each constraint were cumulated and the mean score was adopted as depicting the level of severity of the constraint.

Age- was measured in years

Gender- dummy variable taken as 1 for male 0 for female

Marital Status- dummy variable taken as 1 if married, 0 otherwise

Educational Level- dummy variable taken as 1 for degree holders and 0 otherwise
 Working experience- was measured in years
 Monthly Income- was measured in Naira

Results and Discussion

Socio-economic Characteristics

Selected socio-economic characteristics of the extension officers are presented in Table 1.

Table 1: Socio-economic Characteristics of Respondents **N= 60**

Variables	Frequency	Percentages
Age(Years)		
≤30	5	8.3
31-50	44	73.3
>50	11	18.4
Total	60	100.0
Gender		
Male	42	70.0
Female	18	30.0
Total	60	100.0
Marital Status		
Married	49	81.7
Single	11	18.3
Total	60	100.0
Educational Level		
< University degree	32	53.3
University degree	22	36.7
>University degree	6	10.0
Total	60	100.0
Working Experience(Years)		
≤10	26	43.3
>10	34	56.7
Total	60	100.0
Monthly Income(N)		
≤20,000	4	6.7
20,001-30,000	38	63.3
>30,000	18	30.0
Total	60	100.0

Source: Field Survey, 2014

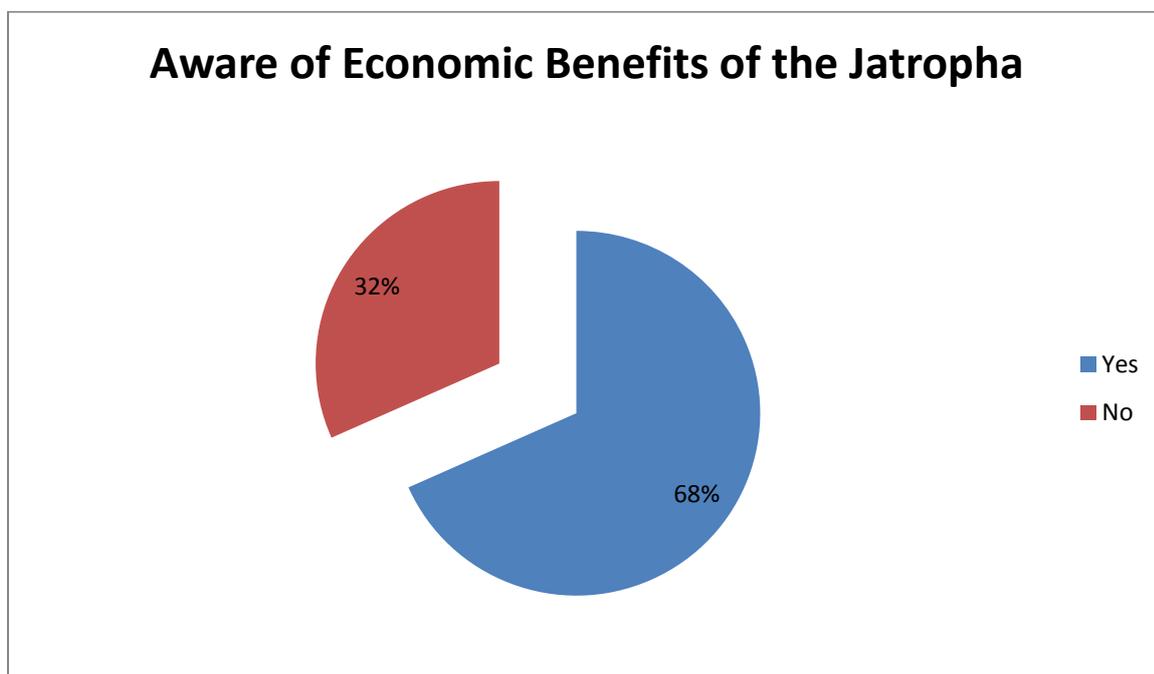
Age has been inversely linked to (Oladele and Wakatsuki, 2011). The table reveals that the modal age group of the favourable disposition to innovations

extension officers is between 31 and 50 years with only 19 percent being of over 50 years of age. This finding suggests that the extension officers are relatively young and it may be expected that they would be more open to new ideas. Majority of the extension officers are male (70%) and married (81.7%). Higher education attainment is expected to translate to increased awareness and easier understanding of innovation. About half of the extension officers possess a minimum of a university degree. Educational qualification possessed by the remaining half included the National Certificate in

Education (NCE), Ordinary National Diploma (OND) and Higher National Diploma (HND). More than half of the extension officers (57%) have been engaged in agricultural extension services for over 10 years while 70 percent earn not more than N30, 000.00 monthly.

Awareness on Economic Benefits of Commercialization of the Jatropha Plant

Figure 1 presents a summary of the responses on the awareness of agricultural extension officers on the economic benefits of the Jatropha Plant.



Yes (Aware), No (Not aware)

Figure 1: Awareness of Economic Benefits of the Jatropha Plant

Source: Field Survey, 2014

As shown in Figure 1, 41 respondents representing 69 percent of the total number of respondents had minimum scores of six out of ten and were classified as being aware of the economic benefits of the plant. This implies that the extension officers have a relatively high level of awareness on the economic benefits of the Jatropha plant.

Role Played in Promoting the Commercialization of the Jatropha Plant

Table 2 presents a summary of the investigation into the role played by extension officers in promoting the commercialization of Jatropha.

Table 2: Role played in Promoting the Commercialization of Jatropha

Respondent has played significant role in promoting Jatropha Commercialization	Frequency	Percentage
Yes	17	28.3
No	43	71.7
Total	60	100.0

Source: Field Survey, 2014

As revealed in Table 2, only 29 percent of the respondents have played roles in a minimum of six out of the 10 investigated areas in which agricultural extension agents can promote the commercialization of Jatropha and are therefore categorized as having played significant roles. This is

worrisome particularly in light of the fact that 69 percent of them were classified as being aware (Table 2) of the economic benefits of the plant. It is possible that the content of extension messages are pre-determined in such a way that extension officers are restricted to subjects as

advised from the fortnight meetings with the subject matter specialists of the ADP. Their individual perception on the commercialization of the plant may also affect the extent to which they promote same.

Level of Awareness and Perception on Commercialization of the Jatropha

Table 3: Result of Correlation between Level of Awareness and Perception on Commercialization of the Jatropha

		Score on Role Played in Promoting Commercialization of the Jatropha	Score on Level of Awareness of Economic Benefits of the Jatropha
Score on Role Played in Promoting Commercialization of the Jatropha	Pearsons Corr. Coeff	1	.775***
	Sig(1-tailed)		.011
	N	60	60
Score on Level of Awareness of Economic Benefits of the Jatropha	Pearsons Corr. Coeff	.775***	1
	Sig(1-tailed)	.011	
	N	60	60

Source: Field Survey, 2014

*** Significant at 1% level

As shown in table 4, the correlation coefficient (r) was estimated at 0.775 which is significant at 1% level. This implies that a statistically significant relationship exists between the level of awareness of the economic benefits of commercialization of the Jatropha and the role played by agricultural extension agents in promoting

Table 3 presents the result of the Pearson correlation analysis carried out to test for a relationship between the respondents' scores on level of awareness and their scores on role played in promoting the commercialization of Jatropha

its commercialization. This positive coefficient indicates a direct relationship between the two variables indicating that role play increased with increase in awareness level. With this finding, the first hypothesis of the study (H_{01}) is therefore rejected.

Factors Affecting the Perception of Agricultural Extension Officers on the Commercialization of Jatropha

Table 4 presents the result of the regression analysis to investigate the effect of selected socio-economic characteristics on the perception of the extension officers.

Table 4: Determinants of Perception on Commercialization of Jatropha Plant

Variables	β	STD Error	t	P-Value
Constant	59.456	5.386	11.039	.000
Age	-2.881***	0.927	-3.108	.003
Gender	0.256	0.638	0.401	.468
Marital Status	0.106	0.132	0.803	.455
Educational Level	3.621***	2.453	1.476	.001
Working Experience	-1.197	4.301	-0.278	.781
Monthly Income	0.301	0.164	1.835	.170

$R^2=0.687$

$F(6,60)=2.623, P<0.01$

Source: Field Survey, 2014

The multiple regression model with six predictors produced $R^2 = 0.687$, $F(6, 60) = 2.623$, $P < 0.01$. Two of the variables tested (age and educational level) significantly predicted the perception of agricultural extension officers on the commercialization of the Jatropha. These two factors explained 68 percent of the observed variations in perception of agricultural extension officers on the commercialization of the Jatropha. With a

negative coefficients of 2.881, age affected perception at $p < 0.01$. Positive perception on the commercialization of the plant therefore decreased with the age of the extension officers. Educational level on the other hand positively affected perception at $p < 0.01$ with a coefficient of 3.621. This implies that positive perception increased with educational attainment. The second hypothesis of the study (H_{02}) is therefore also rejected.

Constraints to the Commercialization of the Jatropha Plant

Table 5 presents results of investigation into the constraints to the commercialization of the plant. It shows the ranking of the identified constraints in order of severity

Table 5: Commercialization of the Jatropha Plant

S/N	Constraint	Mean Likert Score	Ranking
1	Unavailability of ready market	2.97	1
2	Inadequacy of capital	2.57	2
3	Poor Knowledge of farmers on economic benefits	1.83	3
4	Poor knowledge on processing	1.51	4
5	Inadequacy of high quality seeds	1.50	5
6	Competition with food crops for resources	1.48	6
7	Inadequacy of land	1.30	7
8	Inadequate storage facilities	0.86	8
9	Socio-cultural/Religious beliefs	0.27	9

Source: Field Survey, 2014

Table 5 reveals that the most severe constrained as perceived by the agricultural extension agents is the unavailability of ready markets for the produce with the highest mean score of 2.97. The score indicates that almost all the extension agent considers unavailability of ready market to be a very severe constraint. Inadequacy of capital followed closely with a score of 2.57. Poor knowledge among farmers about the economic benefit of the plant as well as its processing ranked third and fourth respectively while inadequacy of storage facilities and socio-cultural/ religious beliefs were not considered to constitute constraints to the commercialization of the plant.

Conclusion and Recommendations

The study analyzed the perception of agricultural extension officers on the commercialization of the Jatropha in Kwara State, Nigeria. The study concluded that although there is a high level of awareness on the benefits of the commercialization of the jatropha among agricultural extension officers in the state, role played by them in promoting the commercialization of the plant is poor. High positive perception was recorded among the extension officers. A significant and direct relationship was observed between the level of awareness and role played in promoting the commercialization of Jatropha. Age of the extension officers and their educational level influenced their

perception at $p < 0.01$. Unavailability of ready markets and inadequacy of capital were identified as the most severe constraints to the commercialization of the plant.

Based on the findings of the study, it is recommended that agricultural extension officers should be trained to prepare them for their roles in promoting the commercialization of the *Jatropha* plant among farmers in the study area. Markets for the produce should be assured through buy back contract arrangements with end users such as biofuel companies while international markets should also be facilitated. In addition, the challenge of inadequate capital should be addressed by a multidimensional approach which will involve out grower schemes, government backed loans, NGOs and loans from strengthened farmer-groups.

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