



## Rural Households' Attitude towards Potential Use of *Jatropha* for Environmental Restoration in Saki West Local Government Area of Oyo State, Nigeria

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**ABSTRACT:** The study examined rural households' attitude towards potential use of *Jatropha* for environmental restoration in Saki-West Local Government Area. A purposive sampling procedure was used in selecting due to deforestation for charcoal production, while 120 respondents were sampled with a simple random technique from the study area. The data were collected through a well-structured questionnaire with interview section, and were analyzed with frequencies, percentages, mean scores, and Pearson product moment correlation. There was correlation between rural households' awareness on use of *Jatropha* and use of *Jatropha* for environmental restoration ( $r = 0.399^{**}$ ,  $p < 0.05$ ). The respondents' attitude was significantly related to their behavior in utilization of *Jatropha* for environmental restoration ( $r = -0.182^*$ ,  $p < 0.05$ ). The study showed that awareness and attitude of rural households strongly influenced use of *Jatropha* for environmental restoration. The implication of this study is to ensure that the environment becomes free of hazards and degradation which affect survival of the ecosystem and biodiversity. Hence, government should join in the advocacy to open continuous channels of communication on the importance of *Jatropha*, and to also motivate the people to having right attitude towards the use of *Jatropha* as a measure to restoring the environment.

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The degradation of the environment sets in as a result of human activities through immense use of energy. The greater consumption and generation of energy induced a greenhouse effect which has led to deterioration of the environment through depletion of air, water, soils, and the destruction of ecosystem and the extinction of wildlife through opening of forested areas and deforestation (Wikipedia, 2012). When the environment becomes less valuable or damaged, then environmental degradation has occurred. There are many forms of environmental degradation which ranges from destroyed habitat biodiversity loss to destruction of natural resources which are pronounced in soil and wind erosion, flood disaster, deforestation, and desertification. Moreover, there are also negative impacts from activities of man through use of agrochemicals for agricultural purposes which have led to damage of the climate, and the ecosystem and biodiversity. *Jatropha* is essentially useful in improving the soil fertility (Kumar and Sharma, 2008). In addition, it reduces both water and wind erosion and increases soil moisture retention. *Jatropha* hedges are planted to reduce erosion caused by water and/or wind (Yammama, 2009). The plant is being used for land reclamation and conservation works by plantation establishment on marginal land, paddocks, hilly slopes and gullies and through its good roots system soil

particles are bonded together to reduce soil erosion (Karavina *et al.*, 2011). There has been consistently plague of the environment through soil erosion in the southwest, desertification and desert encroachment in southwestern Nigeria, and drought in the northern Nigeria, flood in the southwest, north-central and other parts of Nigeria in recent times, precisely in the year 2011 (Ehwarieme and Cocodia, 2011). The exploitation of *Jatropha* is for restoration of the environment through its plantation for prevention of soil erosion, and ecosystem and biodiversity sustenance (Amoah, 2009). The indigence of sustainable environment in this part of the world might be lack of adequate awareness and right attitude among the people generally on corrective measures necessary to ensuring a habitable and danger free environment for man, plants, animals, and wildlife as it were. Therefore, the cultivation of *Jatropha* will serve as a potential plant of utmost importance for environmental restoration but many rural people are yet to be aware of this plant. The participation of rural households in the production of *Jatropha* has become inevitable in Nigeria and other developing countries of the world. *Jatropha* is promoted as a drought resistant plant with high potential growth on degraded soils which has positive environmental impact (Ostwald *et al.*, 2011). Hence, the accessibility of rural households

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to adequate awareness will contribute to their attitude to cultivate *Jatropha* for environmental restoration. Nevertheless, attitude to use of *Jatropha* and awareness programmes from non-governmental organizations would have influence on the use of *Jatropha* for environmental restoration. But how accessible are these farmers to awareness programmes on the use of the plant? The purpose of the study was to examine rural households' attitude towards use of *Jatropha* for environmental restoration in Oyo town, Oyo State, Nigeria. The specific objectives were to determine awareness of rural households in the study area, assess attitude of respondents to use of *Jatropha* in the study area, and examine the potential use of *Jatropha* for environmental restoration in the study area.

## MATERIALS AND METHODS

*Study area:* The study was carried out in Saki West Local Government of Oyo State in the south-western Nigeria. The state is made up of 33 Local Government Areas. It has a population of 5,591,589 consisting 2,809,840 males and 2,781,749 females (NPC, 2006). The state is divided into four agricultural zones namely: Ibadan/Ibarapa (Forest and derived savannah), Oyo (Derived savannah), Ogbomosho (Derived savannah) and Saki (Guinea savannah). The land area covers a vast landmass of 32,249.10 km<sup>2</sup> out of which 27,107.93 km<sup>2</sup> is cultivable (OYSADEP, 2001). Saki West Local Government Area of Oyo State due to high level of deforestation for charcoal production in the area. Saki West LGA of Oke-Ogun in Oyo State is located in the Western part of Nigeria. Saki West is located on the longitude 8°40' North and latitude 3°24' East. The vegetation within the study area can be described as typical Guinea savannah vegetation zone with favorable rainfall and adequate soils. There are 11 wards in Saki West LGA which comprises about 224 villages that include Idi-apa, Sannisala, Alabafe, Aba-Adenye etc (OYSADEP, 2001). The state is predominately agriculture based with about 70 percent rural population. The predominant occupations of the people in the study area are trading and farming.

*Sampling procedure and data analysis:* The study area was selected with purposive sampling due to desert encroachment due to deforestation. The target population was the rural households. There were 11 wards in the Saki West LGA comprising 224 villages. Hence, four (4) villages; Alabafe, Ayate, Sannisala, and Aba-Adenye known for deforestation due to charcoal production were purposively selected, from which 120 respondents were randomly sampled. Data were collected with the aid of well-structured questionnaire with interview section. The data

collected were analyzed with descriptive statistics such as frequencies, percentages, and mean scores. Also, Pearson product moment correlation was used to test relationship between the dependent variable and the independent variables of the study.

## RESULTS AND DISCUSSION

*Respondents' awareness on *Jatropha* cultivation for environmental restoration:* The results in Table 1 show that half of the respondents (50%) had awareness through advocacy programmes on radio, television, and newspaper which motivated them to cultivate *Jatropha* for restoration of the environment. This implies that respondents in the study area had access to advocacy programmes. The result also show that majority of the respondents (86.7%) participate in a seminar organized by a non-government organization on use of *Jatropha* for environmental restoration. This implies that respondents in the study area are progressive farmers who accept innovation of this renewable energy plants early for its use in mitigating the environment. The result further reveals that 99.2% of the respondents in the study area received awareness programme on *Jatropha* cultivation for use in restoration of the environment. This implies that majority of the respondents in the study area had access to awareness information on *Jatropha* for environmental restoration. This result is in line with the submission of Food and Agricultural Organization (2013) that renewed interest in *Jatropha* among rural households had brought high level of awareness of benefits of the planted for environmental restoration. The implication of these results is that rural rural households' awareness on the use of *Jatropha* has positive influence of their attitude towards use of the plant for environmental restoration.

*Respondents' attitude on use of *Jatropha* for environmental restoration:* Results in Table 2 revealed the mean scores of farmers' attitude on cultivation of *Jatropha* for environmental restoration. There is possibility of using *Jatropha* cultivation for restoring the environment because of its invasive growth on all soil types (mean = 4.58), farmers believe that *Jatropha* is a potential renewable energy plant for environmental restoration (mean = 4.86), *Jatropha* is drought tolerant which makes it useful in controlling soil erosion (mean = 4.55), *Jatropha* cultivation is useful for control of wind erosion and desertification due to its growth on all soil types (mean = 4.47). The implication of the results is that majority of the respondents have favourable attitude towards use of *Jatropha* for environmental restoration. This is in line with the assertion of Van de Ban and Hawkin (1996) that farmers' attitude are more likely to correspond to

their behaviour, and in most cases, attitude influences a broad range of behaviours.

**Table 1:** Respondents' awareness on the use of Jatropha for environmental restoration (N = 120)

Awareness	Yes Frequency	Percentage (%)	No Frequency	Percentage (%)
Advocacy programme on radio, television, and newspaper was the source of awareness motivated me to use of Jatropha for environmental restoration	60	50	60	50
There was participation in a seminar organized by a non-governmental organization for awareness among rural households for Jatropha use for environment restoration	104	86.7	17	13.3
Jatropha cultivation was encouraged among the rural households for soil erosion, wind erosion, desertification, deforestation, and for fertilization of infertile soils as means of mitigating the degraded environment	52	43.3	68	56.7
Awareness programmes were available to rural households	119	99.2	1	0.8

Source: Field survey, 2013

**Table 2:** Respondents' attitude on Jatropha use for environmental restoration (N = 120)

Attitude Statements	SA		A		U		D		SD		Mean
	F	%	F	%	F	%	F	%	F	%	
The seminar organized by the non-governmental organization to sensitize farmers in Oyo State on Jatropha cultivation did not motivate me to plant the crop.	44	36.7	55	45.8	1	0.8	5	4.2	15	12.5	2.10
Jatropha cultivation was possible for me due to proper follow-up on the crop treatment by the non-governmental organization that trained the farmers in the state.	59	49.2	58	48.2	2	1.7	1	0.8	-	-	4.47
I believe cultivating Jatropha could be germane potential for socio-economic wellbeing and environmental benefit.	72	60	45	37.5	1	0.8	-	-	2	1.7	4.54
Cultivation of hybrid species of Jatropha would satisfy me because its germination and growth is very fast and rapid.	78	65	40	33.3	2	1.7	-	-	2	1.7	4.54
The local species of Jatropha would not satisfy me because its germination and growth is not very rapid.	61	50.8	8	6.7	14	11.7	8	6.7	29	24.4	2.47
Environmental conservation could be possible through Jatropha cultivation due to its advantage for an invasive growth on all soil types.	80	66.7	35	29.2	2	1.7	-	-	3	2.5	4.58
Jatropha cultivation for sustainable environment could be facilitated through relevant and right information on the plant.	88	73.3	26	21.7	3	2.5	2	1.7	1	0.8	4.65
I believe Jatropha is a potential renewable energy crop useful in mitigating environmental degradation.	92	76.7	25	20.8	2	1.7	1	0.8	-	-	4.86
Jatropha could be useful in controlling the soil erosion because it has a drought tolerant nature.	77	64.2	38	31.7	1	0.8	2	1.7	2	1.7	4.55
The seeds from Jatropha could serve as a good replacement for inorganic fertilizer to replenish infertile soils due to its organic nature.	52	43.3	32	26.7	11	9.2	3	2.5	22	18.3	3.74
Jatropha cultivation could be used in controlling wind erosion and desertification because it grows on all soil types.	79	65.8	30	25.0	3	2.5	4	3.3	4	3.3	4.47
Jatropha cultivation does not have potential in controlling flood hazard eventhough it grows on all soil types.	6	5.0	3	2.5	1	0.8	35	29.2	75	62.5	4.42

The result on Table 3 shows that 62.5% of the respondents have favourable attitude towards use of Jatropha for environmental restoration while 37.5% of the respondents do have unfavourable attitude towards environmental restoration. This implies that majority of the rural households were aware of the potential use of Jatropha for restoration of environment which translate to high knowledge and possession of right attitude to the potential use of Jatropha for environmental restoration. This finding is line with the submission of Maingi (2010) that farmer's households had access to information opportunities on potential role of Jatropha for environmental restoration.

*Use of Jatropha among respondents for environmental restoration:* Table 4 reveals that most of the respondents agreed that Jatropha is useful for flood control (68.3%), Jatropha can be used for soil erosion control (96.7%), Jatropha is vital for wind erosion and desertification control (94.2%), Jatropha is very active in combating drought (99.2%). The result implies that there is correlation between the use of Jatropha and its use for environmental conservation. This result is in line with Chachage (2003) that Jatropha contributes to the control of wind and soil erosion, flood, and desertification control, serves as organic fertilizer for infertile soils, removes carbon (IV) oxide from the atmosphere and helps in solving deforestation problems in developing countries.

**Table 3:** Respondents' attitude category on use of Jatropha for environmental restoration

Scores	Frequency	Percentage	Minimum score	Maximum score	Mean score
Unfavourable (Below mean)	45	37.5	70	106	93
Favourable (Mean and Above)	75	62.5			
Total	120	100			

Source: Field Survey, 2013

**Table 4:** Use of Jatropha for environmental restoration (N= 120)

Jatropha for environmental restoration	Agree Frequency	Percentage	Disagree Frequency	Percentage
Jatropha is very active in combating drought	119	99.2	1	0.8
Jatropha helps in control of flood.	82	68.3	38	31.7
Jatropha is useful for soil erosion control.	116	96.7	4	3.3
Jatropha is germane for control of wind erosion and desertification.	113	94.2	7	5.8

*Testing of relationship between independent and dependent variables with Pearson product moment correlation:* The result in Table 5 shows that there is a significant relationship between rural households' awareness on Jatropha and their attitude towards use of the plant for environmental restoration ( $r = 0.399^*$ ,  $p < 0.05$ ). The result implies that awareness of rural households on use of Jatropha influences use of

Jatropha for environmental restoration. The result in Table 6 reveals that respondents' attitude towards use of Jatropha is significantly related to use of the plant for the environmental restoration ( $r = -0.182^*$ ,  $p < 0.05$ ). This explains why attitude of rural households is significantly related to use of the plant for the environmental restoration.

**Table 5:** PPMC test of respondents' awareness on use of Jatropha and its use for environment restoration

Variable	r - value	p - value	Decision
Awareness and use of Jatropha for environmental conservation	0.399**	0.000	Significant

$r =$  correlation coefficient,  $p =$  probability level of significance,  $p \leq 0.05$

**Table 6:** PPMC test of respondents' attitude and Jatropha use for environment restoration

Variable	r - value	p - value	Decision
Respondents' attitude and use of Jatropha for environmental conservation	-0.182*	0.045	Significant

$r =$  correlation coefficient,  $p =$  probability level of significance,  $p \leq 0.05$

**Conclusion:** The study revealed that rural households had access to awareness programmes, sensitization, and information on use of *Jatropha* awareness especially through a non-governmental organizations which influenced the use of *Jatropha* for environmental restoration of the environment. The rural households' attitude towards use of *Jatropha* was favourable to strengthening its use for environmental restoration. Hence, the rural households' attitude towards use of *Jatropha* for environmental restoration was germane and positively strong. Therefore, government should be involved in advocacy for *Jatropha* use among rural households for conservation, and ensure open and continuous communication channels to motivate rural households for right and good attitude towards use of *Jatropha* as a measure to restore the environment from effect of climate change and other environmental hazards. Also, there is therefore need for the government to mandate the ministry of environment, relevant agencies and research institutes with the responsibility of ensuring massive planting of the plant in the country. Based on the respondents' favourable attitude towards use of *Jatropha* for environmental restoration, there is need for the government based organization to motivate and support people who are interested in commercial production of the *Jatropha* for restoration of the environment.

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