

Knowledge Levels and Assumed Impact of Alternative Uses of Orphan Crops on Income and Poverty Levels in Kwara State, Nigeria

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Abstract. The study investigated the knowledge levels of orphan crops among farmers in Kwara State, Nigeria using primary data collected from 80 farmers randomly selected from Edu Local Government Area of Kwara State, Nigeria. It was found that farmers are generally aware of them but are not much involved in their production. The alternative use of cassava for ethanol production has the potential to reduce the number of poor farmers from 55% to 47% based on 50% of the mean of gross income or from 90% to 57.5% based on \$1/day. The farmers should be encouraged to engage in the production of these orphan crops for their alternative uses as a quick fix for poverty.

Keywords: Orphan crops, Assumed impact, Poverty level

1. Introduction

Most investments in agricultural biotechnology have centred on widely consumed crops that are traded internationally, such as maize, rice, wheat, cotton, soybeans, and canola (1). Neither the public nor the private sector has invested significantly in genetic technologies in the more diverse minor or “orphan” crops that are often critical in the world’s most disadvantaged regions. Because orphan crops occupy smaller areas and have more limited markets, they are rarely a target of advanced science. Nigeria wants to feed its citizens adequately hence it embarks on the promotion of food security for the country through the instrumentality of policies, projects and various initiatives during the past four decades (2). It was once assumed even in Nigeria that natural resources from where materials for human development are derived were limitless and many nation states lived accordingly; they exploited natural resources recklessly and degraded the environment. However, the reality of climate change that is putting the entire ecosystem in jeopardy, and the awareness that natural resources are finite have changed the hitherto assumption of living without recourse to environmental sensitivity. This seemingly paradigm shift has a far-reaching implication for the national development of all countries since their progress is anchored among others on food security. For instance, as Lucas has rightly stated in the modern world, no nation can truly be great if it cannot feed her populace and no meaningful progress can be made in other sectors of life if there is scarcity of food for the people. No system – whether capitalism, socialism or other political ideologies that mushroomed in Africa and other parts of the world, can sustain the loyalty of underfed and impoverished people (3).

The role of agriculture in food security extends far beyond growth in crop yields and total production. Humankind depends on a wide range of species for food, fiber, nutrition and other needs; however there are a limited number of crops that meet the associated needs. Out of the 7,000 plant species known to have been partly domesticated, only about 30 of them provide 95 percent of the world’s food energy (4). With global food security and economic growth dependent on such a limited number of crop species, the future supply of food and rural income is at risk. Given that 38 percent of Sub-saharan Africa’s total population is undernourished and that the number of undernourished children in the region (Nigeria inclusive) is forecast to increase by 39 percent by 2020 (5), the issue takes on added urgency. Important questions remain regarding the types of investments that are needed for individual crops or crop groupings. Although, there have been

some investments in the field of orphan crop studies, incremental investments could be extremely beneficial to some world's poorest populations, an opportunity often ignored. This study is therefore essentially to bring to the forefront the awareness about Orphan crops, the factors militating against its general acceptance and the effects of their alternative uses on the socio-economic characteristics of the farmers in the study area. The broad objective of this study is to assess the current knowledge levels and also to determine the assumed impact of alternative uses of Orphan crops in Kwara State. The specific objectives of this study are to describe the socio-economic characteristics of the farmers in the study area, identify the orphan crops cultivated in the study area and their relative importance, assess the current knowledge levels about the orphan crops in relation to their other uses (alternative uses) by the farmers in the study area, estimate the income from the orphan crops and their alternative uses, and determine the assumed impact of the alternative uses of orphan crops on the income of respondents in the study area.

2. Methodology

This study was conducted in Edu Local government area, one of the local governments in Kwara State Nigeria. The state covers a total land area of about 32,500 square kilometers and lies between latitudes 7° 45' and °30' North and longitudes 2° 30' and 6° 35' East. The state is bounded by Niger and Kebbi States in the northern part, Kogi state in the East and Osun, Oyo and Ondo State in the South and Republic of Benin in the West. The estimated population of the state is about 1,548,412 people (6). There are a total of 16 local government areas. Agriculture is the major economic activity of the people. The vegetation of Kwara State comprises of guinea savannah zone in the North-East and rain forest in the South-West. The vegetation is wood land with dense shrubs and grasses in the northern part and dense forest and tall grasses with tall trees in the southwest. The rainy season (which is bi-modal) falls between April – July and August - October, while the dry season falls between November and March. Edu Local Government Area was created in 1976 and had 6 districts until 1997 when a local government area was carved out of it to reduce the districts to three. The local government area shares boundaries with Ifelodun in the South, in the East with Pategi, North by River Niger and Niger State respectively.

Multistage sampling technique was adopted for this study, Edu local government was randomly selected from the local governments in Kwara State. The next state was the random selection of five administrative districts from the ten existing ones. Then 16 farmers randomly selected from each of the administrative districts to give 80 respondents in the study area and to whom the structured questionnaires were administered to collect the data. The data collected included demographic data of the respondents, the knowledge about the orphan crops and their current use of them as well as the those being cultivated by the respondents. The knowledge levels was assessed using a four-point likert as 1= no knowledge, 2= low knowledge, 3= moderate knowledge and 4=high knowledge. The interviews were conducted between January 2012 and July 2012.

The data were analysed using descriptive statistics such as frequency, means and standard deviation. The gross income was computed for those farmers the cultivated cassava and the assumed impact was computed by estimating the quantity of ethanol that could be obtained from the freshly harvested roots and compared to the income obtained by sale of fresh roots. In addition, the poverty incidence and impact was determined in line with proposed by Foster, Greer, and Thorbecke (7) and which has been widely used to determine poverty (8, 9, 10). In this particular study, 50% of the mean of the gross income and a dollar a day (\$ = ₦160) were taken as the poverty line.

3. Results and Discussion

The demographic distribution of the respondents is presented on Table 1 while Table 2 presents Awareness of the existence of the some orphan crops. Table 3 sets out the level of awareness of the respondents while Table 4 show the distribution of respondents as per alternative use of cassava for ethanol production and potential income generated. Finally, Table 5 is the impact of cassava on poverty level of the farmers.

The data on Table 1 is very similar to studies in other parts of Nigeria except that the farmers in this study seem to possess higher farm holdings that in many parts of Nigeria (11, 12). The respondents are

generally aware of the existence of the orphan crops (Tables 2 and 3) but they are not involved in their production. It is possible that they are not fully aware of the impact the alternative use could make to their income level as even those involved in cassava production only do so for food purposes. The result on Table 4 clearly indicated a rise in income from NGN87,850.00 to NGN502,000.00 from the same output using the sale level of resources they utilized the fresh roots in producing ethanol which none of them has attempted. In addition, the alternative use for ethanol production has the potential to reduce the level of the poor in the study area from about 55% to 47% based on 50% of the mean of gross income or from 90% to 57.5% based on \$1/day (Table 5). In view of this, while government works out the general policy of poverty alleviation, the farmers should be encouraged by way of enlightenment to get involved in the cultivation of orphan crops, particularly cassava, for their alternative uses. Research must focus on development of appropriate farm-level technology on the processing of the orphan crops, like cassava, into their alternative use.

4. Conclusion

The study investigated the knowledge levels of orphan crops among farmers in Kwara State, Nigeria and found that farmers are generally aware of them but are not much involved in their production. The alternative use of cassava for ethanol production has the potential to reduce the number of poor farmers from 55% to 47.5%. The farmers should be encouraged to engage in the production of these orphan crops for their alternative uses as a quick fix for poverty.

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Table 1: Demographic distribution of respondents

Frequency		Frequency	
Age		Sex	
Below 21	11	Female	1
21-30	33	Male	79
31-40	25	Total	80
41-50	11	Marital status	
Total	80	Single	19
Household size		Married	61
1-5	29	Toatal	80
6-10	28	Educational Level	
11-15	9	Primary	19
16-20	8	Secondary	37
Above 20	6	College of Education	19
Total	80	Adult Education	3
Main occupation		Quaranic Education	1
Famer	64	University	1
Civil Servant	10	Total	80
Health worker	1	Number of farm plots	
Businness	2	1-5	76
Student	1	6-10	2
Mechanic	1	11-15	2
Ferry driver	1	Total	80
Total	80	Method of acquisition of farm plots	
Orphan crop cultivated		Inheritance	51
African rice	48	Communal	26
Cowpea	4	Bought	3
Cassava	20	Total	80
Yam	4		
Swet potato	4		
Total	80		

Source: Field Survey, 2012

Table 2: Awareness of the existence of the following orphan crops

Orphan crop	Aware	Not Aware
African Eggplant	59	21
African Rice	78	2
African Yam Bean	4	76
Amaranth	74	6
Bambara	51	29
Baobab	50	30
Cassava	80	0
Bannana	78	2
Cowpea	76	4
Fonio	18	62
Pearl millet	36	44
Sesame	9	71
Sweet potato	76	4
Taro	72	8
Yam	76	4

Source: Field Survey, 2012.

Table 3: Level of Awareness of the following orphan crops

OrphanCrop	NoKnowledge	LowKnowledge	ModerateKnowledge	HighKnowledge	WeightedMean
Eggplant	7	8	12	53	3.4
African rice	4	2	5	69	3.7
African Yam Bean	74	0	2	4	1.2
Amaranthus	2	12	9	57	3.5
Bambara	2	21	20	37	3.15
Baobab	5	4	26	43	3.28
Cassava	5	2	0	73	3.76
Bannana	2	1	4	73	3.85
Cowpea	2	0	1	77	3.9
Fonio	63	8	6	3	1.3
Pearl millet	33	20	20	7	2
Sesame	69	0	2	9	1.4
Sweet potato	0	1	2	77	3.95
Taro (cocoyam)	6	7	6	61	3.5
Yam	5	0	2	73	3.8

Source: Field Survey, 2012.

Table 4 Distribution of respondents as per alternatives use of cassava for ethanol production and potential income generated

Harvested fresh roots in tons		Estimated output of ethanol from fresh roots harvested (l)	
1-1.7	19	1-255	18
2.7-3.4	8	256-510	8
4.4-5.1		511-765	1
6.1-6.8	5	766-1020	5
7.8-8.5		1021-1275	
9.5-10.2		1276-1530	
11.2-11.9		1531-1785	
12.9-13.6	4	1786-2040	4
14.6-15.3	3	2041-2295	3
16.3-17	1	2296-2550	1
Mean	4.183333333		642.2435897
SD	5.124250052		762.8105051
Min.	0.1		15
Max.	17		2550
Income from fresh roots		Income from estimated ethanol	
1-35700	19	1-204000	19
35701-71400	8	204001-408000	8
71401-107100		408001-612000	
107101-142800	5	612001-816000	5
142801-178500		816001-1020000	
178501-214200		1020001-1224000	
214201-249900		1224001-1428000	
249901-285600	4	1428001-1632000	4
285601-321300	3	1632001-1836000	3
321301-357000	1	1836001-2040000	1
Mean	87850		502,000.00
SD	107609.3		614,910.01
Min.	2100		12,000.00
Max.	357000		2,040,000.00

Table 5: Impact of alternative use of cassava roots for ethanol production on poverty reduction

	Gross income from fresh roots		Estimated gross income from ethanol	
	Based on 50% of mean gross income	Based on \$1 a day	Based on 50% of mean gross income	Based on \$1 a day
Poverty head count	0.55	0.9	0.475	0.575
Poverty gap	0.33	0.761	0.34	0.405
Severity	0.246	0.679	0.2620	0.328