

Effect of Dry Season Tomato Farming on Poverty Alleviation among Women Farmers in Niger State, Nigeria

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Abstract

Generally, the study examines the effect of dry season tomato farming on poverty alleviation among women farmers in Niger State, Nigeria. Specifically, it examines the demographic and socio-economic characteristics of the women dry season tomato farmers, their major sources of resources for tomato farming, marketing and marketing channels for tomato produced as well as the monthly income generated from the sales of harvested tomatoes and the effect on poverty alleviation in terms of provision for food, clothing, housing, health care and children's education. Three Local Government Areas (LGAs), from each of the three geo-political zones of the State were purposively selected. A total of 15 villages were randomly selected from these LGAs and based on the preponderance of women tomato farmers, respondents were purposively selected to give a total of 233. Findings showed that over one-half of the respondents (52.4%), had formal education and married (53.2%), with majority (91.3%), of them having four and more people in their households. Moreover, 41.6% of the women practiced farming as their major occupation. Furthermore, over two-thirds of them cultivated 0.5ha of tomato farm, while only 2.1% of them cultivated above 1ha. Findings indicated that majority of them had more than four years tomato farming experience and access to farm land was never a problem but many of them (51.9%), relied mostly on family labour. Niger State Agricultural Development (NSADP) plays a leading role in the provision of relevant technical information to most of the women farmers especially, in the areas of improved seed varieties among others. Results showed that many of the women (61.7%), usually sold their produce at the village markets, mostly every week either in retails or in bulks or both (47.6%) with an estimated monthly income of between N6,000 and N15,000 by many of them (63%). In view of this, their expenditure performances indicated that many of the women farmers were above average in meeting the following basic needs; food (52%), clothing (48.1%), housing (57%), health care (39.9%) and children's education (19.4%). Generally the effect of dry season tomato farming on poverty reduction as indicated by majority of the women farmers was on the high side. Chi-square tests showed significant relationships between some independent variables and the effect of dry season tomato farming as strategy for poverty reduction; household size ($X^2=246.29, P<0.05$), children's education ($X^2=353.3, P<0.05$) and tomato farming experience ($X^2=121.7, P<0.05$), as well as correlation between income generated and the effect of dry season tomato

farming ($r=0.85$, $P<0.05$). Cobb-Douglas multiple regression analysis model showed a significant relationship between contributions to household expenditures and the effect of dry season tomato farming ($F=6.54$, $P<0.05$). Housing ($t=-3.85$, $P<0.05$), clothing ($t=-3.56$, $P<0.05$) and food ($t=-2.31$, $P<0.05$) were inverse but significant in explaining 62% variation in the effect of dry season tomato farming on poverty reduction. This implies that the more the income realized to meet these basic needs the less the effect of poverty and vice versa. Analysis of Variance also showed a significant difference between household size, income generated and the effect of dry season tomato farming on poverty alleviation ($F=172.5$, $P<0.05$). Conclusively, income generated from dry season tomato farming, to certain extent helped in poverty reduction among women farmers. It is recommended that improved credit assistance and labour saving devices should be put in place to further empower women economically, while special attention is being paid to health care and children's education.

INTRODUCTION

Poverty alleviation describes strategies to eradicate poverty. It is any process which seeks to reduce the level of poverty in a community or among a group of people. Most approaches to poverty alleviation focus on income and subsidy measures. Globally, it was estimated that 1.3 billion people had incomes below the poverty line in 1993 and this had risen to more than 1.4 billion people in the year 2000. (World Bank, 1996). Poverty had various dimensions but that of food is the most fundamental since food accounts for 80 percent of all human basic needs. People who are chronically lacking access to sufficient food are considered to be poor. The number of poor is defined in terms of those people with an income level which does not allow them to access sufficient food. It is also closely associated with a person's least of access to production assets, services and markets. Without access to these, it is unlikely that production and income earning capabilities can be improved on sustainable basis. Therefore, low income limits the poor the ability to produce and or purchase food and other domestically produced products and services (United Nations, 1997). The problems of farmers' income and poverty stem from major factor, such as shortage of water for agriculture, inconsistent rainfall distribution and depletion of farm land. Rain fed agricultural land amounts to 81 percent of the total cultivation in the world, though Nigeria has history of irrigation or *fadama* farming activities.

The most important part of the population that needs to be involved in poverty alleviation is the women in Africa, especially Nigerian women. This is largely because they have become the main producers of local food. This is not to say that they are totally excluded from the production of commercial crops, but that women are more responsible for the feeding of most families and children. They have also become the main labour force in the rural areas due to the absence of men who are seeking works in urban areas (European Commission, 1996).

In a study conducted by Kelly *et al.* (2003) it was found out that among a number of significant poverty impacts, the strongest was the case of vegetables farming technologies which was targeted towards households with relatively small amounts of land and very low investments. It also revealed a substantial returns and positive impacts on female economic empowerment (Adepetu *et al.*, 2005).

Objectives

The broad objective of this study is to examine the effect of dry season tomato farming on poverty reduction among women farmers in Niger State, Nigeria.

The specific objectives are to:

- (i) identify the socio-economic characteristics of the women tomato farmers,
- (ii) examine major sources of resources used for tomato farming,
- (iii) ascertain the marketing opportunities and channels for tomato as well as income generated from it,
- (iv) determine women expenditure performance in terms of their contributions to basic household needs to reduce poverty, and
- (v) determine the effect of dry season tomato farming on poverty reduction among women farmers.

Hypotheses

1. There is no significant relationship between socio – economic characteristics of the women tomato farmers (household size, education and farming experience) and the effect of dry season tomato farming on poverty reduction.
2. There is no correlation between income derived from dry season tomato farming and its effect on poverty alleviation.
3. There is no significant relationship between monthly expenditure performances (in terms of contributions to food, clothing, housing, health care and children's education) and the effect of dry season tomato farming on poverty reduction.
4. There is no significant difference between household size, income generated and the effect of dry season tomato farming on poverty reduction among women farmers.

METHODOLOGY

The study is titled "effect of dry season tomato farming on poverty reduction among women farmers in Niger State, Nigeria". Three Local Govt. Areas (LGAs), one from each of the 3 geo-political zones of the State, were purposively selected for the study (Chanchaga, Lavun and Borgu LGAs).

A total of 15 villages were randomly selected from these LGAs based on the concentration of women tomato farmers in each of the selected LGAs to give a total of 233 women tomato farmers as respondents. A validated Interview Schedule which was subjected to reliability test using Split-half technique ($r=0.88$) was developed to obtain relevant information.

Data collected were analyzed using descriptive (frequency, percentages and means) and inferential statistics (Chi-square, Cobb-Douglas multiple regression model, Pearson correlation and Analysis of Variance (ANOVA) were employed to test the hypotheses.

Measurement of variables

1. The effect of dry season tomato farming on poverty reduction was measured on 4-point Likert rating scale and values were assigned accordingly (very effective=4points, effective=3points, ineffective=2points and very ineffective=1point).

2. Contributions of women tomato farmers to some basic household expenditures (that is, food, housing, clothing, health care and children's education) were measured on 5 point Likert rating scale as very high =5points, high=4points, average= 3 points, ineffective=2points and very ineffective = 1point).
3. The socio-economic characteristics (education, household size and tomato farming experience) were categorized and measured at ordinal level of measurement
4. Explicit form of Cobb-Douglas function form of the Regression equation is written as;
5. $\ln Y = b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + U$,
6. where \ln =natural logarithm, b_0 = constant, U = error term , Y (dependent variable) =Effect of dry season tomato farming on poverty reduction, X_1 =Contribution to food, X_2 =housing, X_3 =clothing, X_4 =health care and X_5 =children's education.

RESULTS AND DISCUSSION

Demographic and socio – economic characteristics of women tomato farmers

Findings in Table 1 revealed that over one-half of the women farmers (52.3%) had formal education, married (53.2%) and most of them had household size ranging from 4 to 9 people (78.4%). Though less than one-half of them practiced farming as their major occupation but over one-third had between quarter of an hectare and one hectare of tomato farms, while majority had more than two years farming experience. According to Becker (1991), family size is an important determinant of whether a family or individuals in poverty because the official measure incorporates family size. More so, theory of demand for children revealed that the number of children in a family will depend on the family income and costs of children. Therefore, income plays a role in family size because farmers with higher income are more able to afford additional children. In terms of the cost of children, costs associated with having children include food, clothing and health care expenses among others. However, large household size may help in the provision of family labour on the tomato farms.

TABLE1: Demographic and socio-economic characteristics of women tomato farmers

Variables	Frequency	Percentage
Highest educational level attained		
Post secondary school	5	2.1
Secondary	42	18.0
Primary	75	32.2
Koranic	38	16.3
No formal education	73	31.3
Total	233	100.0
Marital status		
Married	124	53.3
Divorced	35	15.1
Widow	22	9.4
Single	52	22.3
Total	233	100.0
Religion		
Christianity	117	50.2
Islam	114	48.9
Traditional	2	0.9
Total	233	100.0
Household size		
Less than 4	22	9.4
4 – 6	68	29.9
7 – 9	113	48.5
Above 9	30	12.9
Total	233	100.0
Major occupation		
Farming	97	41.6
Trading	87	37.3
Civil servant	27	11.6
Others	22	9.4
Total	233	100.0
Size of tomato farm (ha)		
Less than 0.25	7	3.0
Between 0.25 and 0.49	87	37.3
Between 0.50 and 0.74	27	11.6
Between 0.75 and 1	107	45.9
Above 1	5	2.1
Total	233	100.0
Experience in dry season tomato farming		
Less than 2 years	11	4.7
Between 2 and 4 years	24	10.3
Between 4.1 and 6 years	76	32.6
Above 6 years	122	52.4
Total	233	100.0

Source: field survey

Major source of resources used in dry season tomato farming

Table 2 showed that the women farmers had access to the use of farm land which was acquired through various sources. Also family friends and personal efforts played a major role in labour supply and finance in the production of tomatoes during the dry season. To buttress the important of credit facilities, Olaleye, (2008) reported a significant difference for both production and income levels of farmers with and without credit facilities. Finding also revealed that the State Agricultural Development Project (NSADP) has continued to play a leading role in the technical information support services to the women farmers, especially in the areas of improved seed varieties which were mostly required by over one-half of the women farmers among others.

TABLE 2: Major sources of resources used for tomato farming

Variable	Frequency	Percentage
Land		
Inherited	10	4.3
Leased for farming	55	23.6
Gift from husband/relations	153	65.7
Purchased	15	6.4
Total	233	100.0
Labour source		
Hired	107	45.9
Family / personal	121	51.9
Labour saving devices	5	2.1
Total	233	100.0
Finance		
Personal savings	73	31.3
Gift from husband/friends/relations	117	50.2
Borrowed	43	18.5
Total	233	100.0
Major source of technical information		
Niger State Agric.Dev.Project	135	57.9
Fadama Project	10	4.3
Friends and relations	88	37.8
Total	233	100.0
Types of technical information		
Improved seed varieties	116	49.8
Fertilizer application / manuring	50	21.5
Planting period / spacing	3	1.2
Pest and disease control	43	18.4
Storage and packaging technologies	21	9.0
Total	233	100.0

Source: field survey

Marketing and marketing channels for tomatoes

This section discusses findings on the various marketing outlets for tomato, frequency at which this was being done, methods of selling and the average monthly income generated from sales of tomatoes by women farmers. Therefore, findings in Table 3 showed that majority of the women farmers sold their produce at village markets (61.4%) compared with sales at farm gates (31.3%) and urban markets (7.3%). The choice of village markets by majority of them might be connected with high cost of transportation and bad roads. In view of this, the women farmers might experience lower monetary returns due to the activities of middlemen which is a common phenomenon in most rural or village markets. The frequency at which the women disposed their produce either in bulks or retailing could enhance their abilities to purchase other goods and services thereby reducing the incidence of poverty. Moreover, availability of appropriate storage facilities and processing technologies could discourage the sales of tomatoes at give away prices at the peak of harvest.

TABLE 3: Tomato marketing and marketing channels

Variable	Frequency	Percentage
Selling points		
Farm gate	53	22.7
Village markets	143	61.4
Urban markets	37	15.9
Total	233	100.0
Frequency of tomatoes marketing		
Daily	53	22.7
Weekly	107	45.9
Fortnightly	73	31.3
Total	233	100.0
Method of sales		
Retailing only	89	38.2
Bulk sales only	33	14.2
Both retailing and bulk sales	111	47.6
Total	233	100.0
Average monthly sales of tomatoes (Naira)		
N1,000 – N5,000	72	30.9
N6,000 – N10,000	121	51.9
N10,000 – N15,000	28	12.0
Above N15,000	12	5.2
Total	233	100.0

Source: field survey

Expenditure performance in terms of contributions to family basic needs

This section considered levels of women contributions to food, clothing, housing, health care and children's education based on their earnings from tomato farming. Therefore, Table 4 revealed that contributions to clothing was average (37%), high for food (35%), very high for housing (36%) and low for both health care (37.3%) and children's education (47.2%). The findings suggested that food, clothing and housing were given greater attention in their expenditures with a view to reducing poverty, while health care and children's education received little consideration. However, reasonable poverty alleviation strategies should encompass adequate provisions for good health care and education of children with a view to eradicating poverty in the societies not only for now but also for generations to come. Generally, majority of the women indicated that dry season tomato farming had positive effect (very effective/effective) on poverty reduction among them (Table 5). It implies that most women (70.4%) were more disposed to dry season tomato farming to meet their basic needs.

TABLE 4: Contributions to household expenditures based on income generated from sales of tomatoes by women the farmers

Expenditure / performance	Very high	High	Average	Low	Very low
Food	40(17.2%)	81(34.8%)	81(34.8%)	17(7.3%)	14(6.0%)
Clothing	65(27.9%)	47(20.2%)	86(36.9%)	14(6.0%)	21(9.0%)
Housing	77(33.0%)	56(24.0%)	62(26.6%)	31(13.3%)	7(3.0%)
Health care	56(24.0%)	16(6.9%)	-	87(37.3%)	74(31.8%)
Children's education	26(11.2%)	19(8.2%)	34(14.6%)	110(47.2%)	44(18.9%)

Source: field survey

TABLE 5: Effect of dry season tomato farming on poverty reduction as indicated by the women farmers

Effect of dry season tomato farming	Frequency	Percentage
Very effective	69	29.6
Effective	95	40.8
Ineffective	22	9.4
Very ineffective	47	20.2
Total	233	100.0

Source: field survey

RESULTS OF TESTED HYPOTHESES

Results of Chi – Square tests in Table 6 showed a significant relationship between each of these variables (i.e. educational level, household size and farming experience) and the effect of tomato farming on poverty reduction. This implies that the higher these variables are the stronger the effect of dry season tomato farming on poverty alleviation. Similarly, Pearson correlation test showed a positive correlation between earnings from tomato farming and its effect on poverty reduction, ($r = 0.85, P < 0.05$). Also, Cobb-Douglas regression analysis showed a significant relationship between expenditure performance of women and the effect of dry season tomato farming on poverty alleviation ($F = 6.54, P < 0.05$). It further revealed that food ($t = -2.32, P < 0.05$), clothing ($t = -3.56, P < 0.05$) and housing ($t = -3.85, P < 0.05$) were significant in explaining 62 percent variation in the effect of dry season tomato farming on poverty reduction. Analysis of variance (ANOVA) also showed a significant difference between household size, income generated and the effect of dry season tomato farming on poverty reduction ($F = 172.53, P < 0.05$). This suggests that household size and income generated from tomato farming can make a significant difference in the effect of dry season tomato farming on poverty alleviation.

TABLE 6: Regression Analysis

ANOVA					
	Sum of square	df	F-value	P-value	Decision
Regression	7.446	51.489			
Residual	50.593	222.23	6.536	$P < 0.05$	Sig.
Total	58.039	227			

	Beta coefficient	t-value	P-value	Decision
Food ($\log X_1$)	-.148	-2.32	.02	S
Clothing ($\log X_2$)	-.229	-3.56	.00	S
Housing ($\log X_3$)	-.242	-3.85	.00	S
Health care ($\log X_4$)	.029	.457	.65	NS
Children's educ. ($\log X_5$)	.107	1.690	.09	NS

S=Significant, NS = Not significant

Dep. Var ($\log Y$): Effect of dry season tomato farming on poverty reduction.

TABLE 7: Analysis of Variance (ANOVA)

	Sum of square	df	Mean square	F	P-value	Decision
Regression	161.722	2	80.861	172.525	.000	Significant
Residual	107.797	230	.469			
Total	269.519	232				

TABLE 8: Chi – Square results

Variables	X ² Value	df	P value	Decision
Household size	246.29	9	P < 0.05	Significant
Highest educational level	353.33	12	P < 0.05	Significant
Tomato farming experience	181.73	9	P < 0.05	Significant

CONCLUSION

It can be concluded that dry season tomato farming had, to some extent, enhanced the capabilities of women tomato farmers in their contributions to household basic needs with a view to reducing the effect of poverty. It is therefore recommended that women in the rural areas should be encouraged to contribute more to the educational and health needs of their families with a view to eradicating poverty. Government should also complement the efforts of the women farmers by embarking on programmes that will further empower the women economically.

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