

COMPARATIVE ECONOMIC ANALYSIS OF ONION PRODUCTION AMONG PARTICIPATING AND NON-PARTICIPATING FARMERS IN HADEJIA VALLEY IRRIGATION PROJECT, JIGAWA STATE, NIGERIA

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ABSTRACT

The study compared the economics of onion production among participating and non participating farmers in Hadejia Valley Irrigation Project. Multi stage sampling technique was used in the study in which Hadejia Valley Irrigation Project and six villages in the project area were purposively selected, In each village 20 onion producers comprising of 10 participating and 10 non participating farmers were selected using simple random sampling technique, making a total sample size of 120 respondents. The data were collected using structured questionnaire and were analyzed using descriptive statistics and farm budget model. The results of the analysis revealed that 41.70% and 34.50% of participating and non participating farmers respectively were within the age group of 31-40 years. Majority of the onion producers in both groups were males. The mean years of experience in onion production for participating and non participating farmers were 17.38 and 17.26 respectively. Majority (73.30%) of the participating farmers and 65.5% of the non participating farmers were cultivating less than one hectare. The net farm incomes realized by participating and non participating farmers were ₦70, 012.50 and ₦56, 560.50 respectively. The major problems militating against onion production in the area includes; high costs of inputs, poor storage facilities, inadequate credit facilities and inadequate improved seeds. Strengthening the cooperatives societies in the study area will greatly improve the farmer's access to agricultural inputs.

KEYWORDS: Comparative, Economic analysis, Onion production, Participating and Non participating farmers, Hadejia Valley Irrigation Project

INTRODUCTION

Onion (*Allium cepa*) is an important food spice and flavoring crop. It is ranked second to tomatoes in importance and consumed in green state and as mature bulbs (Alabi and Adebayo, 2008). Onion which is a complimentary product to tomato is also a popular vegetable crop of major commercial importance throughout the world (Aminu, 2009). According to USDA (2009), approximately 200 million tones of dry bulbs onions are produced in 2009 in the world of which 74.9 million tones were produced in America alone leaving Asia, Europe and Africa with 125.1 million tones.

Onion production in Nigeria takes place mainly in the northern part of the country in both seasons of the year. The major producing states in the country include Kano, Bauchi, Sokoto, Kaduna, Borno, Yobe, Jigawa, Kebbi, Zamfara and Katsina states. Onion is being produced in large quantity in Jigawa State under the Hadejia valley irrigation project which is under Hadejia-Jamaare River Basin Development Authority. The Hadejia valley irrigation project was conceived in 1978 with the objectives of harnessing, the water resources of Auyo, Kafin Hausa, Jahun and Hadejia Rivers and the vast arable land in the area for irrigation agriculture all year round (FMWR, 2005). In Auyo local government area alone, about 7000 hectares of irrigable land was developed (FMWR, 2005). Considering the enormous financial and

human resources needed in irrigation agriculture, effort must be made to ensure that the project is harnessed by farming populace at the project site. According to Kura (2002), since the inception of Hadejia valley irrigation project (HVIP) in 1995, low performance of irrigation has been observed and cropping intensity was as low as 9%. This makes policy makers and researchers to ask several questions about the return on investment among the participating farmers, so as to ascertain the worthiness of the venture. However, to explore more about the benefits of the project and its viability comparison must be made on the profitability of production enterprises among participating and non-participating farmers in the project area. Onion was selected based on the intensity of its production in the area.

This research was therefore undertaken with onion production enterprise as the basis of comparison. The research was designed with the following objectives to; Describe the socio-economic characteristics of participating and non-participating onion farmers in HVIP area, estimate and compare the costs and returns in onion production among participating and non-participating farmers in the study area and identify the major constraints militating against onion production among both group of farmers in the study area.

METHODOLOGY

The study was conducted at Hadejia Valley Irrigation Project (HVIP) area which lies between longitude 9.5°E and 10.5°E and latitude 12°N and 13°N, the vegetation characteristics of the area is that of Sudan savanna with annual rainfall of about 490mm and an average temperature of 32°C (HVIP, 2009). The total population of the inhabitants in the area was 1,256,926 (NPC, 2006). It covers 46% (69,000ha) of the estimated 150,000ha of Fadama lands in Jigawa state, of which 10% (6900ha) of Fadama land of the project area have been developed and put under irrigation farming (FMWR, 2005). The soil type is light and generally loamy due to continuous cultivation. The project has so far developed 700 ha of irrigable land (FMWR, 2005).

Sampling Technique and Sample Size

Multi stage sampling technique was used in the study. The first stage involved purposive selection of the Hadejia valley irrigation project and in the second stage six villages were also selected using purposive sampling technique because of high onion production and HVIP activities. The third stage involved the selection of 10 participating onion producers from the list of members of the Water Users Associations and

10 non-participating onion producers from the list generated in each village using simple random sampling technique, making a total sample size of 120 respondents.

Data Collection Procedure

The data were collected using structured questionnaire. The information solicited from the respondents included socio-economic characteristics of respondents, production inputs, prices of the inputs, output obtained and the prices sold, as well as constraints associated with onion production. A total of 118 questionnaires were retrieved out of the 120 distributed as two non participating farmers failed to respond.

Data Analysis

The data were analyzed using descriptive statistics (such as frequencies, mean, percentage and standard deviation) and farm budget technique. Net farm income was employed to measure profitability of onion farming enterprise of both group of farmers. The technique has been widely used by many researchers as a measure of profitability (Balogun *et al* 2006, Abubakar *etal* (2009) and Baba 1993). The farm budget model is specified as:

$$NFI = GFI - TVC - TFC \text{-----} (1)$$

Where:

NFI = Net Farm Income

TVC = Total Variable Cost

TFC = Total Fixed Cost

RESULTS AND DISCUSSION

The distribution of respondents according to socio-economic characteristics is presented in Table 1. Results from the table revealed that majority (61.7%) of the participating farmers and (56.6%) of the non-participating farmers were within the age group of 21-40 years, while the mean age for participating and non-participating farmers were 42.35 and 40.94 respectively. This implies that majority of the respondents were in their active and productive ages and were likely to adopt new innovations. Table1 also shows that majority (98.40%) of the participating farmers and 100% of the non-participating farmers were males. This can be greatly attributed to the fact that the study area is Muslim dominated area in which women are put under seclusion. The table also revealed that majority (51.72%) of the participating farmers and 59.0% of the non-participating farmers had a household size of 11-20 people. The mean household size was 9 for participating farmers and 11 for non-participating farmers. This may be attributed to the practice of polygamy among the inhabitants

of the area and their belief in large families for farm labour. The respondents had acquired one form of education or another as indicated in the table. Respondents who had religious education constituted 43.33% and 44.83% for participating and non-participating farmers respectively which is lower than the 60% and 56% for participating and non participating farmers respectively as reported by Abubakar *et al* (2009) for onion producers in Zamfara state. Those that acquired secondary education constituted 20.00% and 24.14% for participating and non-participating farmers respectively which was higher than the 10% and 2% for participating and non participating farmers respectively reported by Abubakar *et al.* (2009). Majority (56.70%) of participating farmers and 53.4% of the non-participating farmers had 11-20 years of experience in onion production. The mean years of experience were 17.8 and 17.26 for participating and non-participating farmers respectively, implying that there was high level of experience in onion production among both group of farmers in the study area.

Table 1: Distribution of Respondents According to Socio-Economic Characteristic

Variable	Participating Farmers		Non-participating Farmers	
	Frequency	Percentage	Frequency	Percentage
Age				
21-30	12	20	7	12.1
31-40	15	41.70	20	34.50
41-50	17	28.30	19	32.80
51-60	6	10.00	11	19.00
61-70	-	-	1	1.70
Mean	42.35	-	40.94	
Gender				
Male	59	98.40	58	100
Female	1	1.60	-	
Household size				
1-5	14	24.14	9	16.10
6-10	11	18.96	11	19.60
11-15	14	24.14	17	30.40
16-20	16	27.58	16	28.60
21-25	3	5.17	3	5.40
Mean	9		11	
Educational level				
Religious Educ.	29	43.33	26	44.83
Primary Educ.	14	23.33	11	19.00
Secondary Educ.	12	20.00	14	24.14
Tertiary Educ.	5	8.33	7	12.06
Farming Experience				
1-10	14	23.30	17	29.20
11-20	34	56.70	31	53.40
21-30	11	18.40	10	17.20
31-40	1	1.70	-	-
Mean	17.80		17.26	
Total	60		58	

Source: Field Survey (2009)

Farm Size dedicated to Onion Production

The distribution of respondents according to onion farm size is presented in Table 2. Results from Table 2 shows that majority (73.3%) of participating and 65.5% of non-participating farmers had an onion farms size of less than one hectare, while the mean farm size were 0.73 ha and 0.72 ha for participating and non-participating farmers respectively. This result contradict the findings of Abubakar *et al* (2009)

who reported the mean onion farm size of participating and non-participating farmers in Zamfara state as 2.15 ha and 1.22 ha respectively and Baba and Wando (1998) who reported an average farm size of 1.92ha for participating farmers and 1.55 ha for non-participating farmers in Niger State, which may be due to the fact that participating farmers in their area of study had greater access to land compared with the present area of study.

Table 2: Distribution of Respondents According to Farm Size Devoted to Onion Production

Farm size (ha)	Participating Farmers		Non-participating Farmers	
	Frequency	Percentage	Frequency	Percentage
Less than 1	44	73.30	38	65.50
1-2	16	26.70	20	34.50
Total	60	100	58	100
Mean	0.73	28.30	0.72	
Min.	0.50	10.00	0.25	
Max	1.50	-	1.25	

Source: Field Survey (2009)

Contact with Extension Agents

The distribution of respondents according to contact with extension agents is shown in Table 3. The result reveals that majority (56.57%) of participating farmers and 58.63% of non-participating farmers had only one contact with extension agents in a cropping season. This

shows low level of extension delivery among the farming groups. However the participating farmers had more contacts with extension agents than the non participating farmers implying that participating farmers had more access to extension services than their counterparts.

Extension education is an important way of disseminating new techniques and technology to farmers as it helps in acquisition and adoption of

new methods of production which will raise productivity and standard of living of the rural farmers.

Table 3: Distribution of Respondents According to Contact with Extension Agents per Cropping Season

No of Contacts	Participating Farmers		Non-participating Farmers	
	Frequency	Percentage	Frequency	Percentage
1	34	56.57	34	58.62
2	21	35.00	11	18.96
3	4	6.66	-	-
No Contact	1	1.66	13	22.41
Total	60	100	58	100

Source: Field Survey (2009)

Costs and Returns Analysis for Onion Production

The average costs and returns associated with onion production among participating and non-participating farmers are presented in Table 4. The result reveals that the average variable cost of onion production constituted 85.76% and 95.93% of the total cost for participating and non-participating farmers respectively. However, the total variables cost of production for participating farmers (₦29, 698.34) was higher than that of non-participating farmers (₦27, 520.30). This can be attributed to the cost of labour and water related costs while participating farmers employed hired labour, the non-participating farmers utilized family labour which is cheaper. This finding contradicts the findings of Abubakar *et al* (2009), Baba (1993) and Baba and Wando (1998) who in their separate studies in Zamfara, Bauchi and Niger states respectively reported that the variables cost for non-participating farmers exceeded that of participating farmers. The cost of labour constituted 59.58% and 67.78% of the total cost

of onion production among participating and non-participating farmers respectively. This agrees with the findings of Abubakar *et al* (2009) who reported that labour accounted for 97.82% and 96.38% of the total cost of onion production among non-participating and participating farmers respectively. Table 4 also indicated that fixed costs of production constituted 14.24% and 4.07% for participating and non-participating farmers respectively. This shows that participating farmers had higher fixed capital investment than the non-participating farmers. Result from the table also shows that the net farm incomes for the participating and non-participating farmers were ₦70, 012.46 and ₦56, 560.56 respectively. This implies that both group made profits however the participating farmers made higher profit margin than the non-participating farmers. The net farm income realized by the groups was lower than the net farm income of ₦132, 820.55/ha and ₦113, 651.64/ha for participating and non-participating farmers in Zamfara state as reported by Abubakar *et al* (2009).

Table 4: Average Costs and Returns to Onion Production among the Participating and Non-participating Farmers in Hadejia Valley Irrigation Project

Variable	Participating Farmers		Non-participating Farmers	
	Frequency	Percentage	Frequency	Percentage
a. Variable cost (₦/ha)				
Water related cost	1312.5	3.79	-	-
Cost of seeds	648.00	1.87	759.36	2.65
Cost of chemicals	2920	8.43	3041.38	10.60
Cost of fertilizer	4186.24	12.09	4275.54	14.90
Cost of labour	20,631.60	59.58	19,443.72	67.78
Total variable cost	29,698.34	85.76	27,520.30	95.93
b. Fixed costs (₦/ha)				
Depreciation on equipment	1179.20	3.41	1167.24	4.07
Rental value on land	3750.00	10.83	-	-
c. Total fixed costs	4929.20	14.24	1167.24	4.07
d. Total costs	34,627.54	100	28,687.54	100
e. Gross income (₦1ha)	104,640.00	-	85,218.00	-
Net income N/ha (e-d)	70,012.46	-	56,560.56	-
Return/naira invested	2.02	-	1.97	-

Source: Field Survey (2009)

Constraints Associated with Onion Production

The distribution of respondents according to onion production is presented in Table 5. The table reveals that both groups identified inadequate storage facilities as a critical problem to onion production in the study area. This was attributed to poverty level of the farmers as they cannot afford improved storage structures for their produce. This made the farmers to sell their produce at cheaper prices at harvest period due to produce glut in the market. All the respondents also acknowledged poor access to credit facilities which are needed to procure inputs for their farming operations. This made the farmers to underutilize most of the inputs needed for their farming activity. Poor market infrastructural facilities were also a problem as acknowledged by 86.2% of the participating farmers and 86.2% of the non-participating

farmers. High cost of labour was acknowledged by 76.7% of the participating farmers and 100% of the non-participating farmers, labour is a critical and central factor in agricultural production especially in small scale rural agriculture where almost every activity is carried out manually. The table reveals that 40% and 100% of participating and non-participating farmers identified poor water supply as a constraints to onion production. The non-participating farmers were not supplied with water by the HVIP management as they failed to participate because they relied on shallow wells dug on the Fadama farms. However, poor canal maintenance, poor water management, refusal to pay for water charges as well as the dam water level policy of the HVIP was identified as causes of poor water supply to the participating farmers.

Table 5: Constraints Associated with Onion Production in Hadejia Valley Irrigation Project.

Constraints	Participating Farmers		Non participating Farmers	
	Frequency	Percentage	Frequency	Percentage
Poor Storage Facilities	60	100	58	100
Transportation Problem	39	65	34	58.6
Poor Extension Services	24	40	58	100
High cost of inputs	38	63.3	51	87.9
Pest and diseases	45	75	29	50
Insufficient water supply	24	40	58	100
Poor access to credit	60	100	58	100
Inadequate fertilizers	25	41.7	49	84.4
Poor market facilities	50	83.3	50	86.2
Labour shortage	44	73.3	52	87.9
High cost of labour	46	76.7	58	100
Inadequate improved seed	37	61.7	51	87.6

*Multiple responses

Source: Field Survey (2009)

CONCLUSION

Onion production among the participating and non participating farmers in the study area was dominated by males whom were in their active stage in life with low level of western education. Both group produces onion at subsistence level and participating farmers had more access to extension services than the non participating farmers .Onion production was profitable in the study and participating farmers earned more profit. Expansion in onion production was limited due to high costs of inputs, shortage of labour, poor access to credit and storage facilities.

RECOMMENDATIONS

Based on the research findings there exist the need for government through the Jigawa State Agricultural and Rural Development Programme (JARDA) and HVIP management to mount intensive extension education on the agronomic practices of onion production in the area. Cooperative societies should be strengthened in area to aid procurement of inputs, loan acquisition and marketing of onion for its members. The management of HVIP should carry out an awareness campaign to mobilize non-participating farmers to be part of the project for them to benefit from the availability of water resources in the area.

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