

ASSESSMENT OF THE INFLUENCE OF GOVERNMENT INTERVENTION PROGRAMME ON SUGARCANE PRODUCTION IN NIGERIA: EVIDENCE FROM JIGAWA STATE

D. A. Babalola¹; V. O. Okoruwa²; B. T. Omonona² and O. A. Oni²

¹*Department of Agricultural Economics & Extension, Babcock University, Ilishan Remo, Ogun state, Nigeria. P.M.B*

²*Department of Agricultural Economics, University of Ibadan, Ibadan, Oyo state, Nigeria.*

Abstract

This study assessed the influence of government intervention through the Millennium Village Commission Programme (MVCP) on sugarcane production in Jigawa state. The data was collected from 120 farmers benefitting from MVCP and 160 not benefitting. Descriptive statistics, budgetary technique and logit regression were used to analyze data. Result showed that respondents have low education but relatively good experience in the cultivation of sugarcane. Most farmers not participating in MVCP did not participate in Community Based Organizations (CBO). However, most of the farmers have access to extension service. The farmers who participated in MVCP earned significantly higher net farm income. Factors influencing participation were farmers' farming experience, educational level, perception of the programme, previous participation in government programme and membership of a CBO. The study recommends that the MVCP is laudable but for it to have its full impact, participation must be increased through extension education and CBO. Also, strict adherence to set out objectives by government as regards programme intervention generally is imperative.

Key words: budgetary technique, government intervention, Jigawa, logit regression, millennium village commission programme, sugarcane.

1. INTRODUCTION

The demand-supply gap of major industrial crops in Nigeria and most countries in Sub-Saharan Africa is largely met by importation (Wada et al. 2006; GAIN 2008). This is because most of the vital inputs in production such as planting material, fertilizer, herbicides and irrigation facilities are not always within the reach of the farmers (Wayagari et al. 2003), thus, crippling the return on investment and discouraging the farmers from continued production of these crops. This has contributed significantly to the poverty state of the nation judging from the fact that Nigeria is an agrarian economy and agricultural development is a *sine qua non* to economic growth. One of such industrial crops is sugarcane.

Considering the shortfall in sugarcane production in Nigeria, the government has set up and mandated research institutes and agencies such as the National Sugar Development Council (NSDC) and Nigeria Cereal Research Institute (NCRI) to facilitate increase in sugarcane production and utilization. The Millennium Village Commission in Jigawa State is a fall out from this initiative. However, many if not all the established institutes have not met the set out objectives (Olofintoye 2002; Babalola et al. 2009).

The first Millennium Development Goal (MDG) is to eradicate extreme poverty and hunger amongst the population. For Jigawa State which has over 85% of its population residing in rural areas and engaged in subsistence agriculture, achieving this goal without sustained

growth in the agricultural sector would be difficult. As a leading sector providing employment for the majority of the people, agriculture is an obvious choice in government's poverty alleviation and economic empowerment strategy.

Consistent with the Millennium Development Goals, for Jigawa, the key objective of the agricultural sector is to achieve substantial poverty reduction, increase food security and nutritional value especially for women and children and contribute to sustainable employment opportunities through sustained agricultural growth and economic empowerment of the farmers. Another strategic objective is for the agricultural sector to play a prominent role in providing an enabling environment for investment and agro-based economic growth. These policy objectives took into account the high incidence of rural poverty and the predominance of the rural poor in the state's population (CDF 2009). Some of the strategic changes ushered in by Jigawa State Government in 1999 gave birth to the Millennium Village Commission (MVC) (Isma'ila 2006). Like many other government intervention programmes, the main objective of the MVC was to assist farmers produce more efficiently and profitably through input sourcing and subsidy arrangement, facilitating credit sourcing procedures and monitoring farmers' agronomic activities (Serra et al. 2008; Muhammad 2002).

Furthermore, the Tennessee Valley Authority (TVA) [a USA based organization] was commissioned in 2000 to study development potentials and challenges confronting Jigawa State and to make appropriate recommendations (CDF, 2009). Core in its recommendation was the strengthening of programmes geared towards cash crop production (with emphasis on sugarcane, cotton, gum-arabic, mangoes and sesame seeds). This initiative involved support to farmers by providing them with seeds and seedlings, agricultural inputs and access to credit (CDF 2009).

A combination of false starts and ineffective implementation of the budgets proposed for these posed a major constraint limiting these initiatives from making the desired impact in developing the state economically and socially (Muhammad 2002). The Millennium Village, which is the agency saddled with the responsibility of financing the sugarcane farming project, has been largely incapacitated to perform its functions effectively.

Based on the consumption patterns and projections, Nigeria may need to spend more than ₦12 billion each year on sugar importation if local production of sugar is not encouraged and improved (NSDC 2003). This situation can lead to crisis for sugar users. Furthermore, the stated policy of the government is to move Nigeria quickly from dependence on imports to at least 70 percent self sufficiency in domestic sugar production in the near term (GAIN 2008). If the challenges are ameliorated, government initiative through programme intervention has been proposed as a sure way of making the farming business more rewarding and to encourage increased local production of industrial crops such as sugarcane. It is against this backdrop that this study investigated the economic impact of the Millennium Village Commission programme on sugarcane production in Jigawa state.

Understanding the reasons why farmers adopt innovations is also important for government to design packages that will assist in restructuring and predicting the rate of take-up of new technologies and innovations (Marshall *et al.* 1997; Windle & Rolfe 2005). Past studies have shown that socio-economic and institutional factors can affect farmers' responses to innovations and intervention programmes (Fenton *et al.* 2000; Cary *et al.* 2001). The specific socio-economic and institutional variables influencing the sugarcane farmers' participation in the MVC programme in Jigawa state were also examined in this study.

1.1 Statement of Hypothesis

The following null hypotheses were tested:

H₀₁: there is no significant difference in the net farm income of the MVC farmers and the NMVC farmers.

H₀₂: farmers’ specific socio-economic and institutional factors do not significantly influence their participation in the MVC programme.

2. METHODOLOGY

The study was carried out in Jigawa State. The major occupation in the state is farming (NBS 2007). The abundant Arable land makes Jigawa State one of the most agriculturally endowed states in the country. The State boasts of about 70 percent cultivable landmass during the rainy season. Bush fallow constitutes about 10 percent. Grazing reserves and forest estate constitute 10 percent and 5 percent respectively. With about three months of rains, the climatic condition favours the cultivation of only the short- lived crops such as millet, sorghum and groundnut. Other crops cultivated in the state such as sugarcane are supported by irrigation (JARDA 2000; Babalola et al. 2009). Despite the climatic condition, Jigawa state has been identified as one of the major sugarcane producing states in Nigeria capable of meeting industrial demands (GAIN 2008). The state has 7 major irrigation schemes, 11 borehole-based and 3 small irrigation schemes. One of the major schemes (Hadejia Valley Project) covers a land area of about 300 ha. Major crops grown during the dry season are tomatoes, peppers, onions, wheat, lettuce, carrot, garden eggs, maize and sugarcane. While during rainy season, additional crops planted include millet, maize, sorghum, beans, groundnut, rice, melon, *sobo* (*Hibiscus* spp), cotton, cassava and ginger. This study covers six of the 27 local government areas in the state. They are so chosen because evidence of long term production of sugarcane existed in these regions. They include Birnin Kudu, Gwaram, Dutse, Kazaure, Auyo and Jahun (Table 1).

The sampling frame used for the study was collected from State Ministry of Agriculture and State Agricultural Development Project (ADP). Data were collected with the aid of a carefully designed questionnaire. Sugarcane being a perennial crop, information collected from farmers was based on 5-year production activities with the assistance of personnel from both ADP in the official study area and researchers in the sugarcane estates. Field survey was carried out between August 2008 and March 2009. Data collected include those on socio-economic characteristics of the farmers, their farm size and location, variety cultivated; other input variables and output variables.

Multi-stage sampling technique was used to select representative households for the study. The first stage was the purposive selection of 6 local governments from the 27 local governments in the state. The second stage was the stratification of sugarcane farmers in the selected local governments into the beneficiaries of the MVC and non beneficiaries (NMVC). The third stage is the random selection of 280 farmers (120 MVC farmers and 160 NMVC farmers).

Table 1: Distribution of questionnaire to Respondents

Local Govt.	MVCF		NMVCF	
	Distributed	Retrieved	Distributed	Retrieved
Dutse	24(120)	24	31(300)	31
Birnin Kudu	24(120)	22	31(250)	28
Gwaram	24(70)	17	31(200)	22
Jahun	24(130)	22	31(180)	30
Auyo	24(130)	21	31(120)	27
Kazaure	24(80)	16	31(110)	20
Total	144(660)	120	186(1,160)	160

Population of farmers in Parenthesis derived from records with MVC and farmers under extension agent supervision, collected from the extension arm of the ADP

Source: Field Survey, 2008

Data collected was analyzed using descriptive statistics, logit regression model and budgetary technique. The stated hypotheses were tested using the t-test and the regression model. The budgetary technique was used to determine per hectare net farm income among the two group farmers.

The procedures are as follows:

$$TR - TVC = GM \quad \dots\dots\dots (1)$$

$$GM - TFC = NFI \quad \dots\dots\dots (2)$$

Where:

- TR = Total Revenue per season
- TVC = Total Variable Cost per season
- GM = Gross Margin per season
- TFC = Total Fixed Cost per season
- NFI = Net Farm Income per season

Since sugarcane is a perennial crop, a compound factor is used to bring the value of past years to their present year value. The concept of compounding applies to an investment which takes place periodically (Kay 1987; Awoyinka and Ikpi 2005; Babalola et al. 2009) and the value as at present is called the Future Value (FV) i.e. $FV = P (1 + i)^n$ (for all the seasons considered) Where FV = Future Value of either cost or revenue; P = the present sum; i = Interest rate; n = Number of seasons ($0 \leq n \leq 4$), base year represented by zero.

Sequel to the above discussion, the following was computed:

- a. Compound Gross Margin (CGM) = Gross Margin/Season x Compound Factor (CF)
- b. Compound Net Farm Income (CNFI) = Net Farm Income per season x compound factor
- c. Total Compounded Gross Margin (TCGM)
- d. Total Compounded Net Farm Income (TCNFI)
- e. Total Compounded Gross Margin per hectare (TCGM/ha)
- f. Total Compounded Net Farm Income per hectare (TCNFI/ha)
- g. Average Compounded Gross Margin per hectare (ACGM/ha)
- h. Average Compounded Net farm Income per hectare (ACNFI/ha)

The logit regression model was used to determine the factors influencing farmers' participation in the MVC programme. Following Amemiya (1981) and Gujarati (1988) the model is specified as follows:

$$\ln (P_i/(1-P_i)) = \beta_0 + \beta_1 X_1 + \dots + \beta_8 X_8 + e_i \quad \dots\dots\dots (3)$$

Where:

- P_i = probability of farmers' participation in the MVC programme; $1-P_i$ = probability of not participating
- β_0 = Intercept; $\beta_i (1,2,3,\dots,8)$ = Regression coefficients; $X_i (1,2,3,\dots,8)$ = Independent variables, and e_i = error term.

The following variables have been hypothesized to influence the participation in the MVC programme either positively or negatively:

- X_1 = farming experience in years; X_2 = farmers' experience cultivating sugarcane in years;
- X_3 = educational level (at least a secondary school education=1, otherwise=0); X_4 = farm size, (hectares);
- X_5 = perception of the programme (good=1, poor=0); X_6 = participation in previous government program (yes=1, no= 0);
- X_7 = membership of Community Based Organization i.e farmers' cooperative (yes=1, no=0);
- X_8 = access to extension services/education by farmer, (yes=1, no= 0);

3. RESULTS AND DISCUSSION

3.1 Socio-economic and institutional characteristics of farmers

Socio-economic variables of importance considered in this study were years of education and experience in farming, household size and age of head of the household. Results shown in Table 2 showed that, for the Millennium Village Commission (MVC) farmers, the mean age was 4 years while, for the Non-Millennium Village Commission (NMVC) farmers, the mean age was 58 years. This result implies that on the average, MVC farmers were younger than NMVC farmers and are, relatively, still in their active working age. They could therefore still contribute significantly to farm production for many more years. Farmer's educational level is expected to have significant positive influence on farmers' participation in development programme (Fawole & Fasina 2005). The majority of the farmers in the study had one form of education or the other. However, 83 percent (133) of the NMVC farmers had only Qur'anic education; as such, they could only read in Arabic language and might not effectively use materials and equipments whose instructions were written in English. Also, they are likely not going to benefit adequately from programmes and events conducted in English Language (Table 2), The MVC farmers were more educated especially in English (Primary 18%, Secondary 25% and Tertiary 11%). This may be the motivation for their embracing and participation in the Millennium Village Program. Large household size has been reported to be a determinant of food insecurity and poverty of households especially in Nigeria (Ajani 2005; Akinbile & Ndaghu 2005). In this regards, the average household size among the respondents was 10 for the MVC farmers and 13 for the combined category of respondents. The household size among the farmers was on the high side judging by the state's average of approximately 6 and national average of approximately 5 (NBS 2007). Although, this may imply higher availability of family labour, but judging by the fact that the majority of women are not allowed to go to the field to work (following Islamic injunction) and children are either in school or in the apprentice shop training, coupled with the huge economic cost of maintaining large families, poverty level among families was likely to be high. Farmers' year of experience in farming is expected to increase quality and quantity of output by reducing pre-harvest and post-harvest losses and increase efficiency of the farmers. It is even more important among illiterate farmers. The result in Table 2 shows the mean years of experience of the farmers interviewed. The MVC farmers had an average of ten years farming experience while the NMVC farmers had an average of fifteen years of experience in farming. Based on this result, the production potential of the NMVC farmers is expected to be higher than the MVC farmers if adequately supported and motivated.

Institutional factors are crucial in farming activities and in policy implementation. (Shiferaw & Holden 1998; Lapar & Pandey 1999; Gebramedhin & Swinton 2003). The institutional variables of importance examined in this study are farmers' membership of Community-Based Farming Organization (CBFO), their collective participation in government agricultural programmes and access to extension service. The most prominent CBFOs are the farmers' cooperative societies.

Result presented in Table 2 indicates that the majority of the MVC farmers participated in community based farmers' organization (66%) while 45% of the NMC farmers participated. The difference in the levels of education among farmers may be responsible for this. Cooperatives are well known to play a key role in credit and information advancement to farmers as well as facilitating marketing of farm produce. This result implies that NMVC farmers had more chances to avail themselves of the opportunities and benefits derivable from belonging to CBFOs. The extension service coverage in the study area was relatively better than most other agrarian communities. Many of the farmers had access to extension service (58% for MVCF and 57% for NMVCF).

Table 2: Socio-Economic Characteristics of Respondents by Group

Variables	MVF	NMVF
<i>Age</i>		
Mean Age	43	58
S.D.	11.81	21.30
Total No of Farmers	120	160
<i>Education</i>		
Qur'anic	31(25%)	133(83%)
Primary	21(18%)	19(12%)
Secondary	57(48%)	8(5%)
Tertiary	11(9%)	0
Household Size (mean)	10	16
Farming Experience (mean) (yrs)	10	15
<i>Main Occupation</i>		
Farming	101(84%)	133(83%)
Artisan	5(4%)	0
Trading	7(6%)	17(11%)
Civil Service	7(6%)	10(6%)
<i>Membership of Farming Organization</i>		
Yes	76(66%)	72(45%)
No	41(34%)	88(55%)
<i>Access to Extension Service</i>		
Yes	70(59%)	91(57%)
No	50(42%)	69(42%)

Source: Field Survey, 2008

3.2 Farmers cultural practices by group vis-à-vis recommended practices

As a monitoring measure and to facilitate standardization and evaluation, the Millennium Village commission encourages farmers to adopt established recommended cultural practices (Musa 2008). Result in Table 3 shows that none of these recommendations were followed by NMVC farmers. However, the MVC farmers, on the average, adopted only the recommended planting density of between 1,000 and 1,200 plants per hectare and a weeding rate of between four and five times per season. They used less than the recommended fertilizer rate (1,393kg/ha as against recommended 2,000kg/ha to 2,500kg ha) and cultivated less than the recommended hectare (2.8 ha as against recommended minimum of 3ha). The reasons given by farmers for not following the recommended cultural practices are presented in Table 4 using the linkert scale compressed to the three scale level. The result showed that the major reason why most of the MVF have not been following all the recommended cultural practices was because they have been sharing the

resources which ought to have been utilized solely for sugarcane production with other crops. The NMVF, however, were constrained by high cost of some of the inputs, poor access to subsidy and sharing of limited resources among cultivation of many crops (other crops apart from sugarcane are grown on subsistence level).

Table 3: Farmers cultural Practices by Group vis-à-vis Recommended

Variables	Recommended	MVF (Mean Actual)	NMVF (Mean Actual)	Total
Farm size (Ha)	3	2.8	2.1	2.5
Fertilizer (Kg/Ha)	2,000-2,500	1,393	1,250	1,321.5
Planting Density/ha	1,000-1,200	1,102	1,532	1,317
Weeding rate/season	4-5	4	3	3.5

Source: Field Survey, 2008.

Table 4: Reasons given by Respondents for not following Recommended Cultural Practices

Reasons	MVF (n =120)			NMVF (n = 160)		
	Agree	Disagree	Undecided	Agree	Disagree	Undecided
I am not aware	-	120(100)	-	32(20) 101(63)	115(72)	13(8)
The cost is too high	51(43)	69(57)	-	3	59(37)	-
I have more confidence in past experience	2(1)	98(82)	20(17)	67(42)	83(52)	10(6)
I am limited by poor access to subsidy	58(48)	62(52)	-	97(61)	63(39)	-
I do not have confidence in govt. agents	30(25)	90(75)	-	72(45)	83(52)	5(3)
I have to share my resources among various crops	74(62)	32(27)	14(11)	99(62)	50(31)	11(7)

Source: Field Survey, 2008

3.3 Budgetary analysis for sugarcane production.

The structure of the cost and benefits for sugarcane production in the Study area is presented in Table 5 and summarized in Table 6. The result showed that the cost of production for the MVC farmers is lower than that of the NMVC farmers this is as a result of the input incentive and monitoring enjoyed by this group of farmers.

The gross margin and net farm income were calculated based on their future values in year 2007. Thus, the values in 2003 up to 2006 were computed by compounding. Table 7 shows an average compounded gross margin per hectare of ₦157,552.25 (\$1,036.53) for MVC farmers and ₦92,644.49 (\$609.50) for NMVC farmers and an average compounded net farm income per hectare of ₦161,843.00 (\$1,064.76) for MVC farmers and ₦79,541.16 (\$523.30) for NMVC farmers. It is clear from this result that more income benefits accrued to the MVC farmers than the NMVC farmers as a result of MVC programme's impact. The t-test was out for difference in per hectare net farm income for the two groups. The result of the t-test, at 5% level of significance, shows that t-tabulated (1.96) is less than t-calculated (2.05). This implies a

significant difference in net farm income, thus, the stated null hypothesis (H_{01}) is rejected in favour of the alternative hypothesis.

Table 5: Cost and benefits structure per season for Sugarcane Farmers in Jigawa State, Nigeria

Seasons	Programmes	Opportunity Cost of land (OPL)	Cost of Fixed Asset	Cost of Irrigation (CI)	Cost of Planting Materials	Cost of Fertilizer (CF)	Cost of Labour (CL)	Total Variable Cost (TVC)	Total Fixed Cost (TFC)	Total Cost (TC)	Total Revenue (TR)	Gross Margin (Gross Margin)	Net Farm Income (NFI)	Compound	Compound Gross Margin	Compound Net Farm Income (CNFI)
		a	B	C	d	E	F	g=c+d+e+f	h=a+b	i=g+h	j	k=j-g	l=j-i	m	n=k x m	O=l x m
2003	MVC F	153,539	13,842	157,133	183,765	356,810	1,071,170	1,768,878	167,381	1,936,259	31170000	29233741	292333741	1.00	29233741	29233741
	NMVC F	169,917	17,303	224,477	2,888,178	595,000	1,338,962	5,046,617	187,220	5233837	21819000	167772383	16585163		16772383	16585163
2004	MVC F	166,591	15,019	170,491	199,385	387,138	1,124,728	1,881,742	181,601	2063343	34755000	32873258	32691657	1.21	39776642	39556905
	NMVC F	184,363	18,473	243,558	813,367	645,575	1,405,910	3,108,410	202,836	3,311,246	26,182,800	23,074,390	22871554		27920012	27674580.34
2005	MVC F	180,751	16,296	179,697	216,333	420,044	1,58,470	1,974,544	197047	2171591	36703350	34728806	40415819	1.46	50704057	59007095.62
	NMVC F	200,031	19,881	264,260	882,503	677,854	1,448,087	3,272,704	219,912	3,492,616	22731724	19459020	19239108		28419169	28089098
2006	MVC F	196,115	17,681	206,440	234,721	425,747	1,251,148	2,118,056	213796	2331852	38173685	36055629	35841833	1.77	63818463	63440044.40
	NMVC F	217,033	22,631	286,722	441,252	678,000	1,563,935	2,969,909	239,664	3209573	20885379	29369909	17675806		51984739	31286176.60
2007	MVC F	212,784	19,184	223,987	254,672	425,800	1,363,752	2,268,211	231968	2500179	40191054	37922843	37690875	2.14	81154884	80658472.50
	NMVC F	235,481	24,172	311,093	3,133,673	678,020	1,704,690	5,827,476	259,653	6087129	20103085	14275609	14015956		30549803	29994145.80
Total	MVC F	909,780	82,022	1085675	1,088,876	1,658,729	5,996,268	10,001,431	991802	11003224	180,993089	170,981,658	175,873,925		264687787	271896258.50
	NMVC F	1,006,825	102,460	1330110	8,158,973	3,274,449	7,461,584	20,225,116	1,109285	21334401	111721988	102,951,311	90,387,587		155646107	133629163.30

Source: Computed from Field Survey (2008)

Table 6: Summary of Input cost by Group

<i>Input</i>	<i>MVCF Input Cost ₦</i>	<i>NMVCF Input Cost ₦</i>
Labour	5,909,268 (53.7%)	7,461,584 (35.0%)
Planting Material	1,088,876 (9.90%)	8,158,973 (37.9%)
Fertilizer	1,658,729 (15%)	3,274,449 (15.4%)
Irrigation	1,085,675 (9.9%)	1,330,110 (6.2%)
Land Charge	9,097,808(8.3%)	1,006,825 (4.7%)
Asset	82,022 (0.8%)	102,460 (0.5%)
Total	11,003,224	21,334,401

Source: Field Survey, 2008

Table 7: Average benefit accrued to the farmers

Program	THC (ha) A	TCGM (₦) b	TCGM/HA (₦) c=b/a	TCNFI (₦) d	TCNFI/HA (₦) e=d/a	N f	ACGM/HA (₦) c/f	ACNFI/HA (₦) h=e/f
MVCF	336	264,687,787	787,761.27	271,896,258.50	809,215.06	5	157,552.25	161,843
NMVCF	336	155,646,107	463,232.46	133,629,163.30	397,705.84		92,646.49	79,541.16

Source: Computed from Field Survey (2008)

3.4 Determinants of participation in the MVC programme

The result of the logit model for the determinants of farmers’ participation in the MVC programme in the study area is presented in Table 8. The significance of the diagnostic statistics (chi-square and log-likelihood value) shows a good fit for the model. Farmers’ years of experience in farming ($p < 0.05$), farmers’ experience in cultivating sugarcane ($p < 0.01$), their educational level ($p < 0.01$), their perception of the programme ($p < 0.05$), their previous participation in government programme ($p < 0.01$) and membership of a community based organization such as cooperatives ($p < 0.01$) were the factors which positively influence their participation in the MVC programme. This result implies that the participation of farmers’ in the MVC programme will increase with increase in these variables. Based on this result the stated null hypothesis (H_{02}) is rejected in favour of the alternative hypothesis i.e farmers’ socio-economic and institutional variables significantly influence their participation in the MVC programme.

Table 8: Logit Model: Results of the Analysis of the Determinants of Farmers’ Participation in the MVC Programme

Variables	Coefficient (t-value)
Constant	0.16 (1.401)

Farmers years of experience in farming	0.72** (2.15)
Farmers years of experience in cultivating sugarcane	0.22*** (2.84)
Educational level	0.18*** (2.93)
Farm size	0.011 (0.026)
Perception of the programme	0.26** (2.37)
Participating in previous government agricultural programme	1.89*** (2.71)
Belonging to Community-Based Organization	0.46*** (3.25)
Access to extension service	0.94 (0.68)
Log-Likelihood	-104.57***
Chi-square	52.790***
Pseudo R ²	0.50

Number of observation =280; Figures in parenthesis are t-ratios of the coefficients.

*** Significant at 1%; **Significant at 5%

Source: Computed from field survey data (2008)

4. CONCLUSION AND RECOMMENDATION

The study assessed the influence of government intervention programme, specifically, the Millennium Village Commission programme on the income of the sugarcane farmers in Jigawa state. Furthermore, the factors influencing farmers' participation in the programme was determined. The sample frame consisted of 120 farmers who participated in the Millennium Village Commission programme and 160 who did not. The descriptive statistics showed that farming is the predominant occupation among the respondents and they have relatively good experience in the cultivation of sugarcane. Farmers' educational level was generally low and a lot of them, especially those not participating in the programme, do not belong to any community based organization. However, most of the farmers have access to extension services. The budgetary result showed that the farmers that participated in the programme earned significantly higher net farm income. Factors which influenced participation were farmers' years of experience in farming, and in cultivating sugarcane, their educational level, their perception of the programme, their previous participation in government programme and membership of a community based organization. Based on this result, the following have been recommended to assist future efforts of government and policy makers:

- There is the need to place strict adherence to set goals for government intervention programme not just for sustainability but also to enhance farmers' trust and perception.
- Awareness education still needs to be intensified among farmers, especially through the extension outfit.
- The need to encourage farmers to participate in community based organizations especially the cooperatives and to facilitate increasing their literacy level cannot be overemphasized.

REFERENCES

- Ajani OIY. (2005). Determinants of food security of low-income households in the University of Ibadan. *Journal of rural economics and development* 14(2): 91-101.
- Akinbile, LA & Ndaghu AA. (2005). Poverty level & poverty Alleviating Strategies of Farm Families in Michika LGA of Adamawa state. *Journal of rural economics and development* 14(2): 101-109

- Amemiya A. (1981). Qualitative response models: A survey. *Journal of Economic Literature* 19: 1483-1533
- Awoyinka, YA & Ikpi AE. (2005). Economic Evaluation of Farm Income and Technical Efficiency of Resources in Industrial Sugarcane Production in Jigawa State, Nigeria. *Journal of Rural Economics and Development*. 14:1-20
- Babalola DA; OIY. Ajani; BT Omonona; OA Oni & YA Awoyinka. (2009). Technical Efficiency Differential in Industrial Sugarcane Production: The Case Of Jigawa State, Nigeria. *acta SATECH* 3(1): 59 – 69.
- Cary, J., Barr, N., Aslin, H., Webb, T. and Kelson, S. (2001). *Human and Social Aspects of Capacity to Change to Sustainable Management Practices*. Combined report for the National Land and Water Audit Theme 6: Projects 6.2.2 and 6.3.4. Department of Agriculture, Fisheries and Forestry Australia, Canberra.
- CDF. (2009). *Jigawa State Comprehensive Development Framework* Prepared by (SEEDS II Technical Committee) Directorate of Budget and Economic Planning. Available at www.jigawabudget.com. accessed May 2009.
- Fawole, OP & Fasina O. (2005). Factors predisposing farmers to organic fertilizer Use in Oyo State, Nigeria. *Journal of rural economics and development* 4(2): 8-91
- Fenton, M., MacGregor, C. and Cary, J. (2000). *Framework and Review of Capacity and Motivation for Change to Sustainable Management Practices*. Final Report, Land and Water Audit Theme 6: Project 6.2.1, Social Science Centre, Bureau of Rural Sciences, Canberra.
- Gebremedhin, B. & Swinton SM. (2003). Investment in soil conservation in Northern Ethiopia: the role of land tenure security and public programs, *Agricultural Economics*: 29: 69- 84
- GAIN (Global Agriculture Information Network). (2008). *Nigeria Sugar Annual*. Global Agriculture Information Network report (USDA Foreign Agricultural Service). GAIN Report: N18008.
- Gujarati DN. (1988). *Basic Econometrics*. second edition. New York: McGraw-Hill.
- Isma'ila M. (2006). Jigawa reaffirms commitment. *BNW News and archives*, available at www.BNW.com. Accessed January, 2006.
- JARDA (Jigawa Agricultural and Rural Development Authority), 2000. Annual Report, 2000, Jigawa Agricultural and Rural Development Authority.
- Kay R D. (1987). *Farm Management: Planning control and Implementation*. New York: McGraw Hill Book Inc.
- Lapar ML & Pandey. (1999). Adoption of soil conservation: the case of the Philippine uplands, *Agricultural Economics* 12: 241- 256.

- Marshall, G.R., Jones, R.E. and Wall, L.M. (1997). Tactical opportunities, risk attitude and choice of farming strategy: an application of the distribution method, *Australian Journal of Agricultural and Resource Economics* 41, 499–519.
- Muhammad DU. (2002). Governor Saminu Turaki And His Abandoned Projects. Available at www.allAfrica.com. Accessed November 15, 2002.
- Musa H. (2008). Agricultural revolution in Jigawa. Contributed to *Dutse Thisday*. www.dutsethisday.com Accessed December 18, 2008.
- NBS. (2007). Nigeria Bureau of Statistics Annual Abstract of Statistics Population Census, 2007
- NSDC (National Sugar Development Council), 2003. Policy report for the National Sugar Development Council. Available at www.ngnatsugarpolicy.org. Accessed January, 2006.
- Olofntoye J. (2002). *A report on the achievements and problems facing Unilorin Sugar Research Institute*. University of Ilorin, Kwara State, Nigeria.
- Serra T; Zilberman D and Gil José M. (2008). Farms' technical inefficiencies in the presence of government programs. *Australian Journal of Agricultural and Resource Economics*, 52 (1): 57–76.
- Shiefraw B & Holden ST. (2000). Policy instruments for sustainable land management: the case of highland smallholders in Ethiopia. *Agricultural Economics* 22 (2) 217-33.
- Wada AC ; Gbabo A & Ndamba AA. (2006). Cottage Sugar Industries as alternative for meeting Nigeria's Domestic Sugar Demand. *Outlook on Agriculture*, 35 (1): 65-71
- Wayagari J W; Amosun A & Misari SM. (2003). Economic Optimum NPK Fertilizer ratios of Application for High Yield and good Quality Sugarcane Production. *Sugartech* 3(1&2):34-39.
- Windle J and Rolfe J. (2005). Diversification choices in agriculture: a Choice modeling case study of sugarcane growers. *The Australian Journal of Agricultural and Resource Economics*, 49, 63–74.