Does Conflict Affect Agricultural Productivity? Evidence From Agrarian Communities In Akwa Ibom State, Nigeria

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Abstract: This study examined the impacts of conflict on farm resource productivity in Akwa Ibom State, Nigeria. Data for the study were collected through Multi-stage sampling technique from 114 farmers. Analysis shows that land area, quantity of fertilizer and planting materials as well as location of community are important determinant of farm outputs. The location of the community was found to have negative impact on farm outputs. This indicates the conflict status of a community could influence agricultural output from such community. The farmers were found to be efficient in the use of only family labour.

Key Words: Conflict, Productivity, Non-Conflict Communities, Conflict Communities

1. Introduction:

Like other parts of the world, Nigeria's historical landscape is dotted with cases of ethno-political conflict and violence, which climaxed in Nigerian civil war 1967 to 1970. These conflicts result from different value systems, aggressive competition for land, water, political resources and the unhealthy competition of some community leaders. There is hardly a year where there is no major violent community conflict in Nigeria (Banjo 1998, Obasanjo, 1999 and Etuk *et al.,* 2006). In recent times, the situation has grown from ordinary armed conflict to hostage taking of workers of multinational oil corporations, relatives of wealthy community members, politicians during election periods as well as bombing of churches, media houses and other government buildings. These scenarios have resulted in the loss of lives and wanton destruction of properties worth billions of naira.

In Akwa Ibom State, the situation is not different. Akwa Ibom State being one of the thirty-six states located in the southern Nigeria is embroiled in one form of conflict or the other particularly the agrarian communities. According to the Department of States Services (cited by IFPCR, 2002), since 1987 several bloody communal classes have occurred in Akwa Ibom State. For instance, Udom (2004) and Uboh (2004) cited in Akpaeti (2005) reported conflict in and between the following communities in the States: Oku Iboku versus Ikot offiong/Mbiabo (1999); Nwaniba versus Ifiayong Usuk (1996);

Mbiakong versus Ifiayong Usuk (2003): Ikot Umo Essien versus Ngwa in Abia State (1968-89, 1970-70 and 1996-97); Ika (2003 and continued) and Eastern Obolo (2001). In more recent times, we had Etinan-Afaha Nsit crisis (2005), conflict between Eyoabasi and Ilue communities (2011) and between Efiat versus Ebughu communities (2012) as presented in Table 1. These spates of conflict have impacted on economic activities of these communities.

In spite of the common feature of conflict in Akwa Ibom State, empirical information on its impact on agricultural production is virtually nonexistent. Several reports on conflict in the region dwell on the causes, actors and assertion of potential impact (Ojo, 2002). The import of the negative effect of conflict in the region on individuals, organizations and the state may not be clear to the stakeholders in the absence of empirically established and tested information. It is against this backdrop that this study was undertaken to assess conflict, farming and productivity in agrarian communities of Akwa Ibom State, Nigeria. The choice of the agricultural sector stems from its importance to the individuals and the nation as a whole. Presently, this sector employs over 70% of the about 140 million Nigerian population (National Population Census, 2006) and ranks second to oil in foreign exchange earnings and contribution to the GDP. The specific objectives of the study are to: (i) estimate the impact of conflict on crop output and (ii) assess farm productivity.

Table 1: Selected Conflicts Scenarios in Akwa Ibom State

S/No	Conflict Community	Date of Occurrence	Nature/Triggers	Location
1.	Oku Iboku and Ikot Offion/Mbiabo Edere	Dec., 1999	Boundary Dispute	Itu L.G.A of AKS and Odukpani L.G.A of CRS
2.	Nwaniba and Ifiayong Usuk	1996	Boundary Dispute	Uruan L.G.A
3.	Mbiakong and Ifiayong Usuk	23 rd April, 2003	Boundary Dispute	Uruan L.G.A
4.	Ngwa & Ikot Ikot Umo Essien	1968-69, 1970-72 & 1996-97	Boundary Dispute	Obioma Ngwa Communitties of Abia State & Essien Udim of AKS
5.	Ika crisis	8th June, 2003 & 2006	Political Problem	Ika L.G.A
6.	Eastern Obolo crisis	12 June, 2001	Political (Alleged imposition of unwanted leader on the house member, counselors which resulted in ethnic conflict).	Eastern Obolo L.G.A
7.	Ibeno crisis	2006	Political Problem resulting from gang up of counselors against Head of council.	Ibeno L.G.A
8.	Etinan-Afaha Nsit crisis	August, 2005	Dispute resulting from Local Government bike levy.	Etinan/ Nsit Ibom
9.	Eyoabasi and Ilue communities	2011	Land Dispute	Oron L.G.A
10.	Efiat and Ebughu communities	2012	Water resource Dispute	Mbo L.G.A

Source: Akpaeti, 2005; Etuk *et al.,* 2006 and Akpaeti, 2012

2. Theoretical and Empirical Literature

Conflict in behavioral terms is a purposeful struggle between collectives' actors who use social power to defeat or remove opponents to gain status, power, resources and other scale values (Himes, 1980). Ekong (1988) define conflicts as that form of social interaction in which the actors seek to obtain scarce reward by eliminating or weakening other contenders. This may take the form of a fistfight, threats, legislation or a total annihilation. Wilson and Hanna (1990) on their part describe conflict as a struggle involving opposing ideas, value and or limited resources.

The effects of conflicts on the social and economic lives of the society have been a matter of debate. In most developing countries, the scale and prevalence of conflicts are high. Many of these conflicts occur in Africa. Organization of African Unity (now African Union) (1998), reported that from 1963 to 1998, 26 major conflicts had occurred in the continent. Seven of these were classifies as inter-state, while six were related to border disputes, including Algeria/Morocco (1964-65), Somalia/Kenya (1965-80) and Cameroon/Nigeria (1996). The other three are classified as territorial claims relating to disagreement over the interpretation of colonial legal document: Ethiopia/Eritrea, (1998 to the present). The seventh is the conflict between Uganda and Tanzania in 1979. The remaining 19 conflicts are classified as occurring between countries. In Central Africa, these include Democratic Republic of Congo (1964 to 1998), Republic of Congo (1998), Chad (1977-80), Burundi (1993), Rwanda (1992-94) and Sao Tome and Principe (1994). In East Africa, they include Uganda (1970-79), Somalia (1991-99) and Comoros (1995-98). In North Africa, Sudan (1983-89) was the only case in this category. And in West Africa they include Guinea (1970), Benin (1977), Liberia (1990-97), Sierra Leone (1993-98) and Guinea Bissau (1998). Finally in South Africa, they include Angola (1975-99), Lesotho (1998) and Mozambique (1975-92). This has affected not less than 474 million (61%) Africans.

Empirically, Messer (1998) reported that it is only in conflict-affected areas that drought produce famine that kills. Post conflict countries such as Ethiopia and Eritrea in the after math of war have

experienced severe drought, but not famine. Therefore, in 1990, Sub-Saharan Africa countries like Angola, Southern Sudan and Somalia, Experienced food shortages because of active conflict while in Rwanda, Burundi, and to a lesser extent Kenya residents driven by violence from their homes face both immediate and longer-term food shortages because they could not return to plant their crops.

In an earlier study, the International Food Policy Research Institute (IFPRI) (2000) compared actual mean food production per capita with "Peace – adjusted" value for 14 countries. The study found out that in 13 countries, food production was lower in war years with declines ranging from 3.4% in Kenya to 44% in Angola with a mean reduction of 12.3%. The Food and Agriculture Organization (FAO) of the United Nations also adopted a similar methodology to calculate conflict-induced losses of agricultural output in the developing world as a whole over 1970-97. In the sub-Saharan Africa, agricultural losses accounted for 75% of all aid received by conflict-affected countries and far exceeded the level of foreign direct investment. This made FAO to classify countries currently experiencing conflict as "low-income food deficit" with high proportion of food-insecure households.

In Nigeria, the effect of the civil war was in no way different from those earlier mentioned. According to Effiong cited in Nya (2004), the Nigerian civil war of 1967-1970 culminated in wide spread disorder, anarchy and ruthless killing. During this period, the crisis degenerated to the worst level of human depravity. In addition, Demson (2005) said the war led to a structural dis-articulation of the economy as resources meant for development was diverted into prosecution of the war. And because of the general insecurity of lives, people were no longer free to engage in farming, fishing and other livelihood activities. There was also displacement of population. People were compelled to move from their original homes to other places as internally displaced persons while the incidence of disease and poverty was prevalent in the economy.

3. Material and Methods
3.1. The Study Area:
This study was carried out in two known conflict Local Government Areas of Akwa Ibom State of Nigeria. Many parts of the state have experienced crises leading to loss of lives and properties. While conflict may be widespread in the state as in others States, the situation in some communities has been lingering and more devastating than others. Some of such communities in the state include Ikot Umo Essien in Essien Udim Local Government Area, Ifiayong Usuk in Uruan local

Government Area and the entire Ibeno Local Government Area. These Local Government Areas have unenviable records of conflict within the communities, between the communities, within the local government Areas and between Local Government Areas as in the case of Ibeno. There have also been inter-state conflicts, particularly along inter-state border communities. Thus, the two communities-Ikot Umo Essien and Ifiayong Usuk were purposively selected for detailed investigation.

3.2. Sampling and Data Collection Methods
Multi stage sampling method was used in collecting data for study. The first stage was purposive selection of known conflict Local Government Areas namely: Uruan and Essien Udim. These two Local Government Areas have the unenviable record of long drawn conflict within their territories and with neighbouring communities. The second stage was the selection of villages for in-depth study. Two groups of villages were selected. The fist group was known conflicts villages. These were Ifiayong Usuk (in Uruan LGA) and Ikot Umo Essien (in Essien Udim LGA). The second group was selection of the non-conflict villages. The third and final stage of sampling was the random selection of farm households from the four communities. Thirty (30) farm households were sampled in each of the four (4) villages. This gave a total sample size of 120. However, 114 of the respondents provided useful information and were thus, used for the analysis. The data from the study were collected using set of interview schedules. The farmers were interviewed and their response filled into the instrument. Due to the sensitive nature of the subject of investigation, focus Group Discussions could not be held. However, in-depth interviews (IDIs) were conducted with key informant in each community.

3.3. Method of Data Analysis
Regression analysis was used to compute the determinants of crops output from which farm resource productivity parameters (Marginal Physical Product-MPP) and Marginal Value Product (MVP) were derived for conflict communities and non-conflict communities.

Four different functional forms of the regression equation were tried for exploratory purpose - Linear, Double-log, Semi-log and Exponential functions. Of the four functional forms, the Double-log was selected as the lead equation based on econometric, economic and statistical criteria namely the signs and magnitudes of coefficients, statistical significance of coefficients and theoretical justification. Three equations were estimated. They were:

i.   Conflict Communities' Model (CCM)],
ii. Non-Conflict Communities' Model (NCM)] and
iii. Entire Study Area [Pooled Data (PDM)].

The third equation was estimated with pooled data from the two sub-groups. A dummy (location dummy) was introduced in the third equation to capture the effect of the type of community. The implicit of form of the function for the conflict and non-conflict communities respectively are:

$$Q_c = f(F_{la}, H_{la}, F_{er}, Q_{os}, L_{ac})   \qquad (1)$$
$$Q_n = f(F_{la}, H_{la}, F_{er}, Q_{os}, L_{ac})   \qquad (2)$$

The explicit form of the third equation (Pooled data from conflict and non-conflict communities) is:

$$Ln\ COP_p = b_0 + b_1 LnF_{la} + B_2 LnH_{la} + b_3 LnF_{er} + b_4 LnQ_{os} + b_5 LnL_{ac} + b_6 D_{um} + \mu_1 \qquad (3)$$

Where Q_c, Q_n; Q_p = Crop Outputs (in grains equivalent) of farmers, F_{er} = Fertilizer (quantity in kg), Q_{os}= Quantity of seeds (in number of bags), L_{ac} = Land Area Cultivated (in hectare), D_{um} = (Dummy: 1 = Conflict Community, 0 = Non-Conflict Community) and μ_1 = Stochastic error term to be estimated; b_0 = intercept, $b_1 - b_6$ are the coefficients of the respective variables.

3.4. Chow's Tests

Further test was carried out to test whether differences exist in the productivity in the two sets of communities: conflict and non-conflict communities. This was to enable researcher respond to such questions such as: Does the productivity change from one community to the other system? Or is the difference insignificant, so that it may be attributed to chance? To do this, Chow test as suggested by Chow (1960) for test of equality between sets of coefficient in two linear regressions was applied.

3.5. Test for Shifts in Intercept and Coefficients

Test for shifts in intercepts and coefficients using dummy was carried out using dummy variables in the entire study area. According to Olayemi (1998), the essence is to show the possible differences in constant term of regression equations estimated and the coefficients variable of group functions. This would enable us to show the impact of conflict on productivity of input.

4. Results and Discussion
4.1. Impact of Conflict on Crop Outputs and Productivity:

An assessment of factors influencing crop output was carried out using regression analysis. Out

of the four functional forms tried, the double-log function was chosen as the lead equation. The results are presented in Table 2. The adjusted coefficients of multiple determinations (R^{-2}) were 0.783 for conflict communities and 0.517 for non-conflict communities. These imply that the different variables: family labour, hired labour, fertilizer, land area cultivated and planting materials account for 78% and 52% of the variation in crop outputs of farms in conflict and non-conflict communities respectively. The magnitude of the value of R^{-2} indicates that the included production factors play more crucial role in crop production conflict communities than non-conflict communities.

From the result, the coefficient of family labour, hired labour, land area cultivated and quantity of planting materials were significantly different from zero at 1% in non- conflict communities. Only planting materials was significant at 1% level in conflict communities. Land area cultivated and family labour were found to be significant at 5% level in conflict communities. Conflict has a lot to do with availability of labour- human resource whereas it is a highly significant determinant of crop output in non-conflict communities, though, inversely related to output.

Response of output to changes in land area cultivated is elastic. On the other hand, the response of crop output to both family labour and planting material are inelastic. A one unit change in these inputs will result in less than proportionate change in output. Interestingly, the coefficients of these inputs are positively signed, suggesting positive relationship between them and the output. It is also indicative of effective utilization of these inputs. Since the coefficients of the double log function are the elasticity of production, the results could be interpreted to indicate that, a one unit change in the hectarage of land cultivated, would increase output by 1.558 (kg) and 1.000 (kg) for conflict and non-conflict communities respectively. Generally, the result of the model estimation reveals that differences exist in the sensitivity of crop outputs to factors of production in conflict and non-conflict communities.

Data from the two communities were pooled together and a dummy variable added to account for the effect of community type. The result of the regression estimation using the pooled data is presented in column 4 in Table 2. The result shows that land area cultivated, fertilizer, planting materials and location had effect on crop production in the study area. The land area, fertilizer and planting materials all had positive effect on crop output; however, location represented by the dummy variable had negative effect. The fact that the coefficient of the dummy variable is significantly different from

zero implies that the differences observed in the regression result of the conflict and non-conflict communities are not by chance. Thus, it can be concluded that, indeed, crop output can be influenced by whether a community is in conflict or in peace.

Table 2: Result of Regression Analysis

Variable	Conflict Communities	Non-Conflict Communities	Combined
Constant Term	6.303 (O.627)***	7.087 (0.566)***	6.621 (0.143)***
Ln X_1 (Land Area Cultivated)	1.558 (0.209)**	1.000 (0.243)***	8.318E-02 (0.039)***
Ln X_2 (Family labour)	0.137 (0.054)**	9.343E-02 (0.044)***	-2.14E-02 (0.29)
Ln X_3 (Hired Labour)	-4.93E-02 (0.040)	-7.15 E-02 (0.039)***	-2.16E-02 (0.038)
Ln X_4 (Fertilizer)	-4.08E-02 (0.062)	1.398E-02 (0.046)	1.326 (0.162)***
Ln X_5 (Planting Materials)	0.249 (0.060)***	0.182 (0.056)***	0.236 (0.162)***
Dummy			-0.208 (0.036)***
R^2	0.80	0.57	0.704
Adj. R^2	0.78	0.52	0.685
F-Stat	41.72***	10.85***	38.411***
Se	0.61	0.63	0.66

Source: Field Data. Note: Figures in parentheses are the standard errors,
*** and ** implies significant at 1 and 5% levels respectively.

4.2. Chow Tests

The regression result was subjected to further test to ascertain the differences between the estimated equations that is, equation for conflict and non-conflict communities. From the Chow's test result, the F-calculated value was greater than F-tabulated value at 0.05 level of significance, therefore the null hypothesis was rejected while the alternative hypothesis was accepted. This implies that the samples from the two groups of communities differ significantly from each other.

4.3. Test for Shifts in Intercept and Coefficients

This result shows the pooled effect of conflict on the variables. The double logarithm function offers the highest R^{-2} values of 0.706 and F-value of 23.48 and was thus selected as the lead equation.

The functional form is given as:

LnQ = 6.839 + 9.042E-2PFL + 3.319E-03PHL + 1.911E-02PFER +0.959PLAC +
        (0.539)*** (0.044)***   (0.037)   (0.047)   (0.244)***
        0.181PQOS+ 8.440E-02DFL -7.36E-02DHL - 8.12E-02DFER + 0.694DLAC
        (0.057)***   (0.039)***   (0.050)   (0.079)   (0.322)***
        + 8.204E-02DQOS – 0.326 Dum
        (.083)   (0.127)***

The test revealed that conflict reduces autonomous output when the value of the conflict dummy (D) was subtracted from the constant term. This led to a shift in the intercept from 6.839 to 6.513.

4.5. Farm Resource Use Efficiency

The theory of marginal productivity was used to evaluate the efficiency of resource use by the farmers in the study area. The neo-classical economic theory holds that marginal value product must equal marginal factor cost for break-even point to be reached. The comparison of marginal value product (MVP) and marginal factor cost (MFC) reveals the efficiency in the use of each resource. Nonetheless, in this study, other efficiency parameters namely average physical product (APP) and marginal physical product (MPP) were also used to evaluate resource use efficiency (Table 4). The highest APP obtained was family labour followed by planting materials in conflict communities while family labour was the highest and followed by hired labour in non-

conflict communities. Average return to area of land was less than one in the two communities. Viewed from the standpoint of the change in output arising from a unit in resources (MPP), only land cultivated has a value greater than unity for conflict communities while land cultivated and family labour have values greater than unity in non-conflict communities. Family labour and planting materials on the other hand were positive but less than unity in conflict communities while planting materials alone were positive in non-conflict communities. Hired labour and fertilizer in conflict communities and fertilizer in non-conflict communities were not significant in the regression analysis as such were not discussed.

Going by the neoclassical measure of efficiency, farmers in the study area were not efficient in the use of hired labour, fertilizers,

planting material and land area cultivated except for family labour in non-conflict communities. This situation of inefficient use of resources could be attributed to instability in these communities occasioned by conflicts. This could reduce the time and attention farmers can give to farming activities. For instance, weeding may not be done as and when due. The consequence of this is competition between weeds and crops for nutrients and subsequent reduction in crop yield and productivity. In addition, harvesting may not also be carried out at the right time leading to crop loses. Besides this, the ratio of marginal factor product to marginal factor cost was less than unity. This suggests that either the cost of inputs is too high or the prices at which farmers sell their products are too low. Therefore, policy that commensurate price of output with input would help enhance input productivity.

Table 3: Farm Resource Use Efficiency

Resource	Efficiency Parameters in Conflict Communities					Efficiency Parameters in Non- Conflict Communities				
	APP	MPP	MVP	MFC (₦)	MVP/MFC	APP	MPP	MVP	MFC (₦)	MVP/MFC
Land Area Cultivated	0.31	1.56	87.25	1000	0.09	0.2442	1.00	56.00	1000	0.06
Family Labour	32.71	0.14	7.67	300	0.03	27.13	9.34	523.21	300	1.74
Hired Labour	NA	NA	NA	NA	NA	12.97	-7.15	-400.4	300	-1.34
Planting Material	1.1843	0.249	13.944	20	0.097	1.96	0.18	10.19	20	0.51

Source: Field Data. NA- Not Applicable

5. Conclusion

The study examined conflict, farming and productivity in the agrarian communities of Akwa Ibom State. The study found that conflict adversely affected the supply of labour and planting materials in the communities. This implies that the more the conflict occurs in the area, the greater the risk or chances for the productive force (labour) to flee the trouble zone to a safer place for fear of being caught up in the crises. This would lead to abandonment of productive farmland and subsequent decrease in food production from the communities in question and the rest of the society. Farmers in the communities were inefficient in the use of all resources. This and other findings of the study have several implications for food security and agricultural growth in the study area even as Nigeria is experiencing conflict in regions and sections. The findings of the study suggest that agricultural productivity would continue to diminish in the face of violent conflict in the country. Presently, Nigeria is not a food secure

country. Huge foreign reserves are expended annually on food importation. This situation will not only persist but could worsen unless serious steps are taken to stem conflicts in Nigerian communities. Making more land available for agricultural production can also reduce land related conflict. This, in addition, calls for effective implementation of existing land use policy which was intended to enable enterprising farmers' access land in any part of the country for agricultural purposes.

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