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Analyzing Farm Operations Cooperation Groups in Central Agricultural Zone of Delta State Nigeria

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Abstract

The purpose of this study was to examine farm operations cooperation groups in Central Agricultural Zone of Delta State, Nigeria. All the members of the six selected groups were used for the study. The data which were collected with the use of questionnaire and interview schedule were analyzed with the use of frequency counts, percentages and Tobit regression model. Most of the members were females and were also mostly married. Most of them were educated formally and had average household size of 5 persons and average farm size of 2.5 ha. They had an average farming experience of 13 years and most of them had no contact with extension agents. Household members emigrated from most (76.50%) households. They subscribed to these groups because of reduction of labour cost, timely execution and conclusion of farm operations, exchange of ideas and information, expansion of farm size and reduction of drudgery involved in farming. They were mostly satisfied with their various groups. They however had challenges ranging from irregular meeting attendance, inadequate access to extension service, too high membership strength to lateness to work. Inadequate membership strength was also a constraint to few of the groups. The farmers' decision to subscribe to their various groups was informed or influenced by their marital status, level of education, household size, farm size, farming experience, extension visit contact with other farmers, and emigration of household members. It was recommended that extension agents should establish frequent contacts with the various groups and educate them on the importance of time and regular meeting attendance. The groups with bloated membership strength should be split into two groups while farmers need to be encouraged to subscribe to those groups with inadequate membership strength.

Keywords: Farm Operations Groups, Group Cohesion, Group Benefits

1. Introduction

In human life, people have always come together to form groups for their congruent interests. These interests are economically, politically and psychologically related. According to Ogionwo and Eke (1999), throughout human life, people function in groups and depend on the group to achieve their goals. The attributes of groups include shared values and beliefs, consonant goals, ideology and structure (Ofuoku and Urange, 2012).

Cooperative societies are known to be instrumental groups for social and economic promotion. Conventionally, cooperative groups are financially related, but farm operations cooperation groups (referred to as *Ifo* in Urhobo Language spoken in Delta State, Nigeria by the people of Urhobo ethnic nationality) are work related. Farm operations cooperation groups are work related arrangements that are designed to aid members with farm operations on rotational basis every planting season (Chang and Boisvert, 2005).

For example in the farming season, According to Ekong (2003) members ballot on whose farm operations are to be undertaken first in turns. During the early operation such as clearing, member come together to clear each member's farm in turns on rotational basic. The same thing goes for every other operation. These groups can be regarded as self

– help and instrumental groups (Ekong, 2003). Sizes of these groups are often minimally 10 persons and maximally 20 persons (Delta State Ministry of Commerce and Industries, 2010). Ofuoku et al (2006), noted that these groups are careful about who is accepted into their membership as observations have shown that they accept those farmers who are known to have integrity, good reputation, honest and kind heart.

Farmers come together for the purpose of helping themselves and fellow feelings. This means that farmers form groups or cooperation once their individual efforts are directed towards economic challenges to be surmounted. Every human seeks easy ways of achieving his/her goals and by so doing, utilizes the resources at his/her disposal. These resources may be physical, mental, and material in nature (Ogionwo and Eke, 1999; Ekong, 2003; Ofuoku et al, 2006). According to Ogionwo and Eke (1999), Ekong (2003) Ofuoku, 2013, farmer's propensity to subscribe to farmers' groups is influenced by the challenges they confront in their farming business.

Farmers' groups inundate everywhere, yet the level of production among farmers is still inadequate (Ofuoku and Agbamu, 2013). Nigeria has not been able to achieve 5% of the total caloric intake of non-starchy crops recommended by the food and Agriculture Organization (Iwala et al, 2006).

Ofuoku (2009) found that most farmers in Central Agricultural Zone of Delta State, are small – medium scale holder farmers who still depend on the use of energy sapping crude implements. It is the intention of every farmer to improve on his/her level of production, but with the use of such crude implement, the work will be very tiring. Therefore, he/she may require the services of other farm hands/farmers who he/she will also help when it is their turn. If this type of cooperation is sustained agricultural production will gradually improve, especially in the midst of peasantry. The result of this study, when released to agricultural extension agencies and Ministry of Agriculture in Delta State, Nigeria, will be a useful guide in programme formulation and design while planning farm size improvement programme for farmers.

Objectives:

The major objective of this study was to examine farm operations labour cooperative societies in Central Agricultural Zone of Delta State, Nigeria. Specifically, the study sought to:

(i) Ascertain the socio-economic characteristics of the members

(ii) Identify their reasons for joining such cooperation groups

(iii) Ascertain the level of satisfaction of the members.

(iv) Identify the constraint they face in their cooperation groups

(v) Determine the socio-economic factors that influence subscription to the labour cooperation groups.

2. Materials and Methods

This study was carried out in the Central Agricultural Zone of Delta State, Nigeria. The state is located in the Niger Delta Area of Nigeria, while the study area is situated in the central part of the state. Out of the 25 local government areas in the state, Central Agricultural Zone cover nine of them. The area is under mangrove, fresh water and rain, forests vegetative cover.

Agriculture and agro-related activities are the major occupations of the population of the study area. The climate favours the production of various food and cash crops. Animals reared in order of importance include poultry, fishes, goats and sheep. Others are cane rats, snails and bees.

The population for this study comprises of members of all the farm operations labour cooperation societies in Central Agricultural Zone of Delta State, Nigeria.

Multi-stage sampling technique was used. Six (6) local government areas were randomly selected at the first stage. At the second stage one farming community was selected from each of the selected local government areas. The third stage involved the identification and purposive selection of such labour cooperation groups with the assistance of the selected communities heads and random selection of two (2) of the identified labour cooperation groups in each community resulting to the selection of 12 farm labour cooperation groups. The 4^{th} stage involved the purposive selection of 100% of the membership of the selected groups since the membership strength is low. This resulted to selection of 217 respondents (Table 1).

The primary data used were collected using questionnaire for those who had reasonable level of formal education, while interview schedule was used to collect data from those who had little or no formal education. These were administered by the researcher, extension agents and teachers within the various communities selected. The data obtained were analyzed with the use of descriptive statistics such as frequency counts, percentages and means derived from 4 – point likert's type scale of highly satisfied (HS= 4), satisfied (S = 3), fairly satisfied (FS = 2) and not satisfied (NS = 1). The hypothesis addressed objective five and was tested using Tobit

model to estimate the determination of farmers to subscribe to farm operations cooperation group.

The farmer's decision to subscribe to farmers' groups is guided by both the socio-economic characteristics of the farmers and the characteristics and membership of cooperation group membership (edogenous) and the institutional characteristics of the farm operation cooperation (exogenous) so that the observed subscription of farmers to such cooperation group is hypothesized to be the result of the famers socio-system continuum. In order to achieve the objective v, Tobit model was used to estimate the determinants of the decision of farmers to subscribe to such group. The Tobit model was originally developed by Tobit (1958) and it is express as follows:

$$Y=X\beta + E$$

Y is a latent variable that can be observed. If data for the dependent variable is above the limiting factor, zero, Y is normally observed as a continuous variable, if Y is at the limit factors, it is held at zero. This relationship is present as follows in the equations:

$$Y=0 \text{ if } Y^* < Y_0$$
$$Y=0 \text{ if } Y^* < Y_0$$

In this case, the first equation is applied as all respondents are members. In the equation, β is a vector of unknown coefficients, X is a vector of independent variables, and E is error term that is assumed to be independently distributed with mean zero.

According to Tobin (1958), Long and Freese (2006), Tobit model can be utilized while estimating expected value of Y1 as a function of a set of explanatory variables (X) weighted by the probability that $Y_1 = 0$. The expected intensity of subscription to farmers' group, E (Y) is:

$$E(Y) = X\beta F(Z) + 6f(Z) \text{ and } Z = X\beta/6$$

Where F (Z), according to Oladele (2005), is the cumulative normal distribution of Z, f (z) is the value of the derivative of the normal curve at a given point, z is the z – score for the area under normal curve, and is the standard error of the error. The coefficients for variables in the model β do not directly represent marginal effects but the sign borne by the coefficient hill give the researcher the direction of the effect. The variables used in the estimation of the Tobit model are specified as follows:

Y=Farmers' subscription to farmer operations cooperation group (1 (absolute or defined) since they are all members)

X_1=Gender (male = 1, female = 0)

X_2=Marital status (Married = 1, otherwise = 0)

X_3=Level of education (Tertiary = 3, secondary = 2, primary = 1, none = 0)

X_4=Household size (7 – 9 persons = 2; 4 – 6 = 1, 1 – 3 = 0)

X_5=Farm size (>4ha = 3; 3 – 4ha = 2; 1 – 2ha = 1; <1ha = 0)

X_6=Farming experience (> 20yrs = 4; 16 – 20yrs = 3; 11 – 15yrs = 2; 6 – 10yrs = 1, 5 and below = 0)

X_7=Extension visit (yes = 1; no = 0)

X_8=Contact with other farmers (yes = 1; no = 0)

X_9=Migration o household member (yes = 1; no = 0)

Table 1. Selection of Sample Size for the Study

Local government area	Community	Labour cooperation group	Strength
Ethiope East	Eku	Ufuoma Group	18
		Our Lord's Group	25
Ethiope West	Ijenisa	Egnono Group	20
		Progressive Farmers	25
Ughelli North	Emono – Orogun	Indomitable Group	10
		Emono – Coop. Group	18
Ughelli South	Oginibo	Farming Friends	10
		Urhukpe coop	16
Okpe	Adagbrasa	Arable farmer's Group	16
		Unbeatable Group	19
Isolo North	Arhade	Elo Group of Farmers	16
		Atarhe Farming Coop.	18
Total			217

Source: Communities Heads

3. Results and discussion

3.1 Socio-economic characteristics

Table 2 indicates that most (75.12%) of the farmers were females. This is due to the fact that women have taken over arable farming from the males. This confirms the findings of Uzokwe and Ofuoku (2006), Ahmad and Ismail (1998) who found that women are more involved in arable farming than men. This is attributed to the fact that men concentrate on tree crop and livestock farming. In many households many men have migrated to the urban for white collar and other regular income earning jobs. FAO (2006) observes that in many rural areas of the world, increasing number of men are moving to towns and other countries in search of better paid jobs. This development has led to increased number of female – headed households. This leaves the women with no other option than carrying out farming tasks culturally meant for men (Uzokwe and Ofuoku, 2006).

Most (88.94%) of them were married. This implies that they have family needs to meet up with. Most of them attained one level of formal education or the other. Education is expected to make the farmers to have innovative mind and thoughts. They had an average household size of 5 persons. This means that they have medium sized household.

They had an average of 2.5ha farm size. This indicates that most of them were small scale farmers; with an average of 13 years farming experience. However, most 64.06% of them had no contact with extensive agents. This is attributed to the dearth of extension agents (EAs). Agbamu (2011) observed that Nigerian Agricultural Development Programmes (ADPs), the public extension agency operated at the ratio of 1:1, 189 farm families.

Most of the respondents had members of their households that migrated to urban areas. Emigration of household members reduce household farm labour. Ofuoku and Chukwuji (2012) found that rural – urban migration impacted on plantation agriculture in the Niger Delta Region of Nigeria.

Table 2. Socio-economic characteristics of respondents

Variables	Frequency	Percentage (%)	Mean
Gender			
Male	54	24.88	
Female	163	75.12	
Marital status			
Married	193	88.94	
Single	24	11.06	
Level of education			
No formal education	41	18.89	
Primary education	58	26.73	
Secondary education	76	35.02	
Tertiary education	42	19.35	
Household size (persons)			
1 – 3	76	35.02	5 persons
4 – 6	115	53.0	
7 – 9	26	11.98	
Farm size (hectare)			
< 1	54	24.88	2.5ha
1 – 2	75	34.56	
3 – 4	56	25.81	
> 4	32	14.75	
Farming experience (years)			
5 and above	56	25.81	13yrs
6 – 10	78	35.94	
11 – 15	42	19.35	
16 – 20	27	12.44	
> 20	14	6.45	
Extension contact (per month)			
None	139	64.06	
1 time	11	5.07	
2 times	46	21.20	
> 2 times	21	9.68	
Migration of household member			
No	51	23.50	
Yes	166	76.50	

3.3 Reasons for subscribing to farm operations cooperation group

They mainly subscribed to their various farm operations cooperation groups in order to reduce cost of hiring labour (93.55%). For timely execution and conclusion of farm operation (96.77%) exchange of ideas/innovations and information, especially with the dearth of EAs and for expansion of farm size (97.70%). Another reason given was the reduction of drudgery (Table 3). As the members of the group work in their respective members farm, labour is not paid for. What the host farmer does is to feed every member that participates in the operations in his/her farm. It is cheaper to feed the members than to live paid labour. Farm operations, especially for arable crops production are time bound. With participation of the group members the operations are always concluded early enough to fall into the cropping season and stages of development and production of the crops. Farmers have the desire to expand the sizes of their farms. They cannot achieve this with household labour alone, but with the external labour. On subscription to cooperation group, he/she has access to many hands that can easily work on large plots of land for farming. In the process of collectively carrying out farm operations, ideas/innovations and information are traded among members of the group in the bid to bring out the best. This is very important as the number of extension agents are inadequate to reach out to all farmers. This implies farmer – famer extension which is necessary in this era where the ratio of extension agents to farm families is very poor as pointed out by Agbamu (2011).

The drudgery involved in the use of crude implements is reached as the work is done by the members of the group. In the process, they sing local songs crack and at intervals, tell stories. These activities reduce drudgery or boredom. This also means that these benefits are the wants of members of the groups. Ogionwo and Eke (1999) argue that people subscribe to groups when their wants and needs are congruent with the groups' needs/wants. This is expected to lead to cohesion of the groups especially as these wants and needs are satisfied.

3.4 Level of satisfaction of respondents with their cooperation groups

Table 4 indicates that the levels of satisfaction of all the members of the cooperation groups were high and were satisfied with their respective groups except members of Urhukpe cooperation. Generally the farm operations cooperation groups satisfied their members. Satisfaction of group members leads to group cohesion. According to Ofuoku et al (2008), Ofuoku and Urange (2009), Ofuoku and Agbamu (2013), farmers would like to remain in their various groups if their needs are satisfied. Groups remain cohesive as the individual members' needs are satisfied (Ofuoku and Chukwuji, 2012). Satisfaction of members needs is paramount to the survival and longevity of the group. Satisfaction of groups' members is a factor that cannot be neglected or disregarded. It is a very significant variable in the life of a group as that is the major reason for formation of groups, especially self – help and instrumental groups like these ones.

Table 3. Reasons for subscribing to farm operations cooperation groups

Reason	Frequency	Percentage
Reduction of cost of labour	203	93.55
Timely execution an conclusion of farm operations	201	96.77
Reduction of drudgery	61	28.11
Exchange of ideas/innovations of information	216	99.54
Expansion of farmer size	212	97.70

Table 4: Level of satisfaction of respondents with their cooperation groups

Groups	HS (4)	S (3)	FS (2)	NS (1)	Score	Mean
Ufuoma Group (n = 18)	4 (16)	9 (27)	5 (10)	0 (0)	53	2.94
Our Lord's Group (n = 25)	12 (48)	10 (30)	3 (6)	0 (0)	84	3.36
Egwono Group (n = 25)	9 (36)	6 (18)	2 (4)	2 (2)	60	3.0
Progressive Farmers (n = 25)	14 (56)	7 (21)	3 (6)	1 (1)	84	3.36
Indomintable Group (n = 10)	4 (16)	4 (12)	1 (2)	1 (1)	31	3.10
Emono Cooperation Group (n = 18)	6 (24)	8 (24)	3 (6)	1 (1)	55	3.06
Farming Friends (n = 22)	8 (32)	11 (33)	3 (6)	0 (0)	71	3.23
Urhukpe Cooperation (n = 10)	1 (4)	5 (15)	1 (2)	3 (3)	24	2.40
Arable Farmers' Group (n = 16)	5 (20)	8 (24)	2 (4)	1 (1)	49	3.06
Unbeatable group (n = 19)	10 (40)	6 (18)	3 (6)	0 (0)	64	3.37
Elo Group of Farmers (n = 16)	7 (28)	7 (21)	2 (4)	0 (0)	53	3.31
Atarhe Farming Cooperation (n = 18)	6 (24)	8 (24)	2 (4)	2 (2)	54	3.0

Cut – off score = 2.5 ($\geq$ 2.5 = satisfied; < 2.5 unsatisfied)

3.5 Constraints of farm operations cooperation groups

Most of the respondents (78.80%) were of the opinion that inadequate access to public extension service was the most important challenge that confronts them. Irregular attendance to meeting (54.84%) and lateness to work among members (52.53%) were seen as other constraints to their operations in members' farms. Some however considered bloated membership strength as a problem too. Few (9.22%) felt inadequate membership was a challenge to their groups.

Inadequate access to public extension service is congruent with the findings of Ofuoku and Agbamu (2013), who found that inadequate information on extension / farmers' group meetings was a challenge to such groups. Agbamu (2011) point out that the ratio of extension agents to farm families is very poor. Extension agents have the function of helping farmers to help themselves. When this service or help is inadequate or absent, one should not expect improvement in farming activities. Ofuoku et al (2008) also found that irregular meeting attendance is one of the banes of members of fish farmers' groups in Southern Nigeria. This challenge adversely affects operations or functioning of groups as functional information do not get to absentee members early enough.

Lateness to work may eat into the time needed to start and complete operations on members' farms. This is very important as agricultural operations are time bound. When memberships of such groups are more than needed, it will take a longer time to cover every member's farm operation. Inadequate membership may also have the same effect on the farms of members of the groups.

Table 5. Constraints of farm operations cooperation groups

Constraint	Frequency	Percentage
Lateness to work	114	52.53
Inadequate membership	20	9.22
More them adequate members	72	33.18
Irregular meeting attendance	119	54.84
Inadequate access to public extension service	171	78.80

3.6 Estimation of influence of farmers' socio-economic characteristics on decision of farmers to subscription to farm operations cooperation groups.

Table 6 shows that marital status, level of education, household size, farm size, farming experience, extension visit / contact with other farmers and migration of household members influenced farmers' decision to subscribe to farm operations cooperation groups. This means that eight of the socio-economic variables significantly influenced their decision to subscribe to their various farm operations cooperation groups.

Marital status (X_2) had significant influence on the decision of farmers to subscribe to farm operations cooperation groups at 0.05 level of significance. This is congruent with *a priori* expectation. This implies that marriage is one of the variables that enhance the decision of farmers to subscribe to farm operations cooperation groups. Marriage implies added responsibility for the farmer, whether male or female with this added responsibility, the average farmer looks for ways to expand his/her farm size. With increased farm size, he / she may not be able to carry out all the operations alone, especially with the use of simple and crude implements. With the improved farm size, the work will be too enormous for him to do alone.

Level of education (X_3) significantly influenced farmers' decision to join farm operations cooperation group. This is in consonance with *a priori* expectation.

Ofuoku (2013) argues that educated farmers reason progressively and also behave progressively. The comprehension of the functioning of such groups is influenced by education. This comprehension of the groups enhances the decision of farmers to join such groups.

Pandel and Devkota (2007); Chang and Kwiatkoski (2005) found education to influence farmers decision to apply best management practices. Education is therefore a salient variable in farmers' decision making.

Household size (X_4) also significantly influenced farmers' decision to subscribe to such groups at 0.01 level of significance. This means that the smaller the household size, the lower the tendency of farmers to subscribe to farm operations cooperation group. The heavy responsibility to the family borne by the farmers is connected with his/her decision to enlarge their farm sizes in order to increase their level of production. In the presence of enlarged farm sizes farmers require more hands to carry out the operation.

Farm size (X_5) influenced the decision of farmers to join farm operations cooperation groups at 0.05 level of significance. This means that farmers with large farms more easily subscribe to such farmers' groups.

Farming experience (X_6) significantly influenced the decision of farmers to subscribe to such cooperation groups at 0.05 level of significance.

Table 6: Estimated Tobit Model of influence of farmers' socio-economic characteristics on subscription to farm operations cooperation groups

Variables	Coefficient	Z– statistics
Intercept	2.356	2.671
Gender (X_1)	0.094	1.755
Marital status (X_2)	0.046	1.991*
Level of education (X_3)	2.739	18.071**
Household size (X_4)	0.355	11.911**
Farm size (X_5)	0.302	2.091*
Farming experience (X_6)	0.158	1.873*
Extension visit (X_7)	0.512	5.892**
Contact with other farmers (X_8)	0.216	0.310*
Migration of household member (X_9)	4.543	20.229**
Log likelihood	207.988	
Standard error of regression	0.882	

** = significant at 1% level of significance
* = significant at 5% level of significance

According to Ofuoku (2013), more years of experience possessed by the farmer results in better appreciation of farmers groups. Perception of the benefits and importance if cooperation groups is most likely to be influenced by experience of the farmers. With more experience in the business of farming, farmers better appreciate the necessity to subscribe to such farmers cooperation groups so as to mitigate some challenges they encounter with.

Extension visit (X_7) had significant relationship with farmers' decision to subscribe to farmers cooperation groups at 0.01 level of significance. This is attributed to the fact that the more extension agents interact with farmers and educate them on the necessity of subscribing to such group, the more tendency there is for farmers to subscribe to farmers' cooperation groups, the better they comprehend and decide to subscribe to such groups. This is congruent with the findings of Ofuoku (2013). The frequency of extension contact influences farmers' behavior (Ofuoku et al, 2008).

Contact with other farmers (X_8) influenced the decision of farmers to join farmers cooperation group at 0.05 level of significance. The agrees with a priori expectation. The implication is that increased frequency of contact with other farmers would lead to increased likelihood to join farmers' cooperation groups and the necessity to subscribe to membership of one. Other farmers were able to influence these farmers' thoughts and attitude towards such cooperation groups through frequent contact.

Migration of household member (X_9) had significant relationship with the farmers' subscription to membership of farm operations cooperation groups at 0.01 level of significance. This means that increased number of migrants prompts the decision to subscribe to such cooperation groups by farmers. This is attributed to the farm labour shortage created by the absence of the migrants. Ofuoku and Chukwiuji (2012) found that rural – urban migration resulted to adverse effect on plantation agriculture. In another study, Taylor et al (2003) suggest that emigration affected farming activities in the push source.

4. Conclusion and recommendations

Most of the farmers that subscribe to the membership of farm operations cooperation groups were females. Most of them were married and attained one level of formal education or the other, with average household size of five (5) persons and average farm size of 2.5ha. They had average farming experience of 13 years. Most of them had no contact with extension agents while most of the household had members that emigrated to urban areas.

The reasons for subscribing to their various cooperation groups included timely execution and conclusion of farm operations and reduction in the cost of labour. Most of them were satisfied with their cooperation groups. However, they face some challenges such as lateness to work, inadequate access to public extension service, irregular meeting attendance by some members and bloated membership strengths. The decision of the farmers to subscribe to membership of farm operations cooperation groups was influenced by their marital status, level of formal education, household size, farm size, farming experience, extension visit / contact with the other farmers and emigration of members of farming households. It is therefore recommended that:

(i) Extension agents should meet the groups frequently and educate and remind them on the importance of time in agriculture and regular meeting attendance.

(ii) These groups with bloated membership should be split into two groups with the extension agent as the facilitator.

(iii) Farmers should be encouraged to join those groups with inadequate membership strength.

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