

Araştırma Makalesi
(Research Article)

Ege Üniv. Ziraat Fak. Derg., 2018, 55 (3):357-366
DOI: 10.20289/zfdergi.385905

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Effect of Land Conflict on Arable Crops Production in Delta State, Nigeria

Nijerya'nın, Delta Eyaletinde Arazi Anlaşmazlığının Tarla Bitkileri Üretimine Etkisi

Alınış (Received): 12.01.2017

Kabul tarihi: (Accepted): 04.04.2018

Key Words:

Land conflict; boundary dispute, arable crops production, farming activities, effect of dispute

Anahtar Sözcükler:

Arazi anlaşmazlığı, sınır tartışması, tarla bitkileri üretimi, tarımsal faaliyetler, tartışmanın etkisi

ABSTRACT

Objective: This study was designed to investigate the effect of land related conflicts on crop production in Delta State, Nigeria.

Material and Methods: Communities that have and are still experiencing land related conflicts were purposively selected for this study. The community and opinion leaders in such communities were also purposively selected for the study. This resulted to the selection of 255 respondents. Data were collected with the use of questionnaire and structured interview schedule.

Results: All the conflicts were at inter-community level and were caused by boundary disputes. The conflicts took serious dimensions. Arable crop production was adversely affected, but picked up after resolution of the conflicts in most communities. Agricultural activities were negatively affected by the conflict incidences. The conflict cases were managed with adoption of negotiation, security agents, and governmental agencies' intervention and judicial injunction. However they were resolved through legal procedure, intervention of Ministry and Land Survey, and Land and Boundary Commission's intervention. There were significant differences between level of crop production before and after conflicts; significant relationships between magnitude of land conflicts and some socioeconomic characteristics of respondents. Seriousness of land conflicts had inverse significant relationship with agricultural activities.

Conclusion: Government agencies should properly define boundaries between communities, Land and Boundary Commission should promptly wade into land related disputes before they escalate; and communities are required to contact the relevant government agencies to report any matter of disagreement relating to land boundaries with other communities; and extension agency needs to integrate anti-conflict education in their interaction with farmers.

ÖZ

Amaç: Bu çalışma, Nijerya'nın Delta Eyaleti'nde arazi anlaşmazlıklarının bitkisel üretime etkisini araştırmak için planlanmıştır.

Materyal ve Metod: Çalışmada arazi ile ilgili anlaşmazlıklar yaşamış veya yaşamakta olan topluluklar gayeli olarak seçilmiştir. Bu topluluklarda topluluk ve fikir önderleri de gayeli olarak seçilmiştir. Bunun sonucunda 255 katılımcı seçilmiştir. Veriler anket ve yapılandırılmış görüşme formları kullanılarak toplanmıştır.

Bulgular: Tüm anlaşmazlıklar toplumlararası düzeydedir ve sınır tartışmalarından kaynaklanmıştır. Çatışmalar ciddi boyutlara ulaşmıştır. Tarla bitkileri üretimi olumsuz yönde etkilenmiştir. Fakat, çoğu topluluklarda anlaşmazlıkların çözümünden sonra tarla bitkileri üretimi artmıştır. Tarımsal faaliyetler anlaşmazlık olaylarından negatif etkilenmiştir. Anlaşmazlık olayları anlaşma görüşmeleri, güvenlik birimleri ve devlet kurumlarının müdahalesi ve mahkeme kararları ile çözülmüştür. Bununla birlikte, yasal süreç, Bakanlık Araştırmaları ve Arazi ve Sınır Komisyonu'nun müdahalesi yoluyla çözülmüştür. Anlaşmazlık öncesi ve sonrası bitkisel üretim miktarı arasında önemli farklılıklar vardır. Katılımcıların bazı sosyoekonomik özellikleri ile arazi anlaşmazlıklarının büyüklüğü arasında anlamlı ilişkiler bulunmuştur. Arazi anlaşmazlıklarının şiddeti ile tarımsal faaliyetler arasında ters yönlü bir ilişki bulunmaktadır.

Sonuç: Hükümet kurumlarının, topluluklar arasındaki sınırları doğru bir şekilde tanımlaması gerekmektedir. Anlaşmazlıklar artmadan önce, Arazi ve Sınır Komisyonu hızla arazi ile ilgili anlaşmazlıkları gidermeye çalışmalıdır. Topluluklar, diğer topluluklarla arazi sınırları ile ilgili herhangi bir anlaşmazlık sorununu bildirmek için ilgili devlet kurumları ile iletişim kurmalıdır. Yayım servisinin, çiftçilere yönelik çalışmalarının içine çatışma karşıtı eğitimden de dahil edilmesi gereklidir.

INTRODUCTION

Worldwide, 1.5 billion hectares of land can be classified as suitable for arable production (Farmlandgrab.Org, 2010). Farming accounts for about 22 percent of the global agricultural value chain (Deininger and Byerlee, 2011). There are 41.9 million hectares of non-agricultural areas and there are 1.8 million producers globally (Willer, 2011). FAO and UNDP (1997) as cited by Evance (2010) suggest that 12 percent more arable land is available globally, they also estimate that 16 percent of the arable land used now is degraded. This implies expected increase in competition for farm land use and control in the future (Evance, 2010). Land disputes are ordinary in almost all societies of the world (UN-HABITAT, 2009) as land played a vital role for prevalent conflict, peace-building and economic development. According to USAID (2005), geometric growth rate of world population and environmental degradation increases conflicts related to land and these have resulted to competition for land. A number of cases handled in the primary courts over land and property rights account for half (50 percent) of all the caseload courts carried out (World Bank, 2009). Most world communities especially in the developing world's economy depend on subsistence agricultural production. The theory of conflict indicates that in conflicts two or more parties compete for one or more resources (Tonah 2008, Ofuoku and Isife 2012). Land is a basic and crucial among rural people and they depend on it for increased agricultural production. Importance of existing adequate farm land to satisfy the food staff supply gap for the world communities is unquestionable. This implies that there is no livelihood for them as it is the medium for agricultural production. As a result of increased interest in and desire to control land, it is an object of conflict among farmers.

Conflict connotes clash, contention, confrontation, a battle or struggle or quarrel (Nwolise, 1997) over resources of interest. Coser (1956 cited in Otite 2001) defines conflict to mean a kind of struggle over things of values which have scarce status, the desire to acquire power and resources, in which the aims of the opponents are to have upper hand over their rivals. It is of note that conflict emerges as a result of man's thirst for striving man as the social being who in the course of promoting some of his objectives, either intentionally or unintentionally upsets and direct to negative uses, instead of strengthening along beneficial line, some of the arrangement that ought to be for the benefit of man (Nwanegbo, 2005). Conflict becomes violent when it is accompanied with threat and actual destruction of life and property.

For so many different years in parts of the world, conflicts are known to be the major variables destroying

the economy of the people and many factors contribute to conflicts in Africa. These factors range from political, religious, ethnic, economic, land tenure system to historical fends. In addition, where environment and natural resources management issues are important, they are generally contributory factors not only the sole cause for tension (Otsuka, 2006).

Land related conflicts have increasingly become a threat to rural economic activities such as agriculture in most sub-Saharan African Countries (Yamano and Deininger, 2005, Deininger and Castagini, 2006). The prevalence of these conflicts is escalating at a time when crop yields are neither increasing nor decreasing and are ever declining in some countries (Otsuka, 2006). It is therefore glaring that as governments grapple to promote adoption of technologies and revamp the agriculture sector's performance in order to meet the high and increasing demand for food, land tenure security becomes a crucial variable in attaining this goal. However, land governing institutions, including protection property rights, conflict resolution mechanisms and enforcement of contracts are still weak in many African countries and cannot curb the conflict (Fred- Mensah, 1999). Together with population pressure which has resulted to scarcity of land, land conflicts has raised concerns over livelihood of food security and high rate of poverty (Andre and Plateau, 1998; Deininger and Castagnini, 2006).

Land is a crucial natural resource that hosts and sustains living things including man and one of the factors of production of goods and services production process (Magel, 2001). There is socio-cultural dimension to every land. As a result of this fact conflict over land is often combined with strong economic, spatial, cultural and emotional values.

Considering the effect of conflict on the people and their farm business, it becomes clear that once the farmers are displaced and their land abandoned, the extension operation suffers a great deal as there are virtually no farmer left for the extension agent to work with. The extension agents are often at cross road between their job and loyalty to the communities, villages, kindred and individuals who are in conflict where the agents operate.

Land conflict occurs in many forms. There are conflicts between single parties (as for instance boundary conflicts between neighbours, inheritance conflicts between siblings and disputes over the use of given piece of land (Baatar, 2007). Conflict situations threaten the livelihood outcomes and termination of farmers sustainable livelihood income (Bolarinwa, 2007). Conflicts between two communities become a menace when farmers employ negative or aggressive conflict handing style. It further imposes hardship on

the citizens, worsening their social conditions and this leads to mass emigration of farm families.

In rural areas of many countries there are many conflicts which are ethnically based mainly over grazing land and over cattle amongst pastoral people. Similarly there are conflicts over cultivable land among peasant farmers within the same ethnic group and also between ethnic groups. Sometimes these inter-ethnic conflicts over land and land boundaries develop into rebellions and armed fighting between the ethnic groups and the state when the latter send in the military to stop the fighting or even to take side. As earlier stated, agricultural activities are affected by land conflicts. The question now is on how it has affected crop production in the study area.

Objectives of the study

The broad objective of this study was to find out the effects of land related conflict on crop production in Delta state. The specific objectives were to ascertain the types of land conflict; determine the causes of conflicts; determine the farmers' perception of the level of seriousness of land conflicts; evaluate the level of crop production during and after conflict periods; determine effects of conflict on agricultural related activities in the study area; and ascertain the conflict management and resolution strategies used.

Hypotheses

Ho₁: There is no significant difference in crop production before and after land conflict incidences.

Ho₂: There is no significant relationship between land conflict and routine agricultural production activities.

MATERIAL and METHODS

Delta state is among agricultural predominant states of Nigeria situated in the Niger Delta area with a population of 4,098,291. The state has a total land area of 16,842 square kilometers (6,503sq mi). The state covers a land mass of about 18,050km of which more than 60% is arable and perennial crops land, it lies approximately between longitude 5° 00 and 6° 45' East and latitude 5° 00 and 6° 30' north. It is bounded in the north and west by Edo State; in the east by Anambra, Imo and Rivers States; south east by Bayelsa state and on the southern flank by the Bight of Benin which covers about 160km of the state's coastline. Delta state is generally low lying without remarkable hills. The state has a wide coastal belt interlaced with rivulets and streams which form part of the River Niger Delta. Delta state consists of twenty five local government areas.

Delta state is situated in the tropics and therefore experiences a fluctuating climate, ranging from the humid tropical in the south to the sub humid in the northeast. The average rainfall is about 266.5mm in the

coastal areas and 190.5mm in the extreme North. The average temperature of the state ranges between 28°C and 34°C. It lies under mangrove swamp Forest in the extreme south, Fresh water and Rain Forests at the central part, and derived Savannah in the extreme north (Delta State Gazette, 1992). The state is made up of different ethnic groups comprising Urhobos, Ijaws, Ibos, Itsekiris and the Isokos. Farming is the predominant indigenous economic activity of the people with arable and plantation crops cultivation, livestock and fish farming as agricultural activities (Delta state ministry of Economic planning 2008). The state is endowed with rivers and water resources.

During the preliminary survey, communities where conflicts have taken place were identified through key informants in Land and Boundary Commission of Delta state. The communities identified were: (1) Ovre-Eku and Orogho both in Ethiope East Local Government Area of Delta State; (2) Okpolo-Enwhe and Igwide communities both in Isoko South Local Government Area of Delta State; Amai and Umuebu communities both in Ukwuani Local Government area of Delta State; Aladja and Ogbe-ijoh in Udu and Warri South West Local Government Areas respectively.

These communities were purposively selected for this study. Eight (8) community leaders and eight (8) opinion leaders were purposively selected on the basis of being involved in farming with the help of key informants in the communities and 16 farmers were selected randomly from the list of registered farmers in Agricultural Development Programme (ADP) and at the centre of the conflicts resulting to the selection of two hundred and fifty six (256) respondents. However, one (1) questionnaire could not be retrieved from one of the respondents; this reduced the number of respondents to 255, which were worked with.

Data for this study were obtained with the use of questionnaire and interview schedule. Questionnaire was used to collect data from the respondents with reasonable level of formal education while structured interview schedule was used for the respondent with low level of formal education or no formal education.

The data collected were analyzed with the application of descriptive statistics such as frequency counts, percentages and means derived from 4-point Likert-type scale. Inferential statistics were used to test the hypotheses. Objective I was achieved with the application of frequency counts and percentages. Objective II was met with the use of mean derived from 4-point likert type scale of strongly agree=4, agree=3, disagree=2 strongly disagree=1. Objective III was achieved with the use of percentages Objective IV was met with the use of application of 4 point likert type scale of very serious=4, serious=3, fairly serious=2, not serious=1. Objective V was addressed also with the use

of 4 point likert type scale of strongly agree=4, agree=3, disagree=2 and strongly disagree=1.

Hypotheses

Hypothesis I was tested with the use of T-Test.

Hypothesis II was tested with the use of spearman's correlation coefficient.

RESULTS and DISCUSSION

Level of land conflict

The level of conflict between these two communities was measured with 4-point likert type scale. Table 1

Table 1. Types of land conflict
Çizelge 1. Arazi anlaşmazlığının türleri

Level of land conflict	SA (4)	A(3)	SD(2)	D(1)	Score	Mean
Family conflict	0(0)	0(0)	0(0)	0(0)	0	0
Intra community conflict	0(0)	0(0)	0(0)	0(0)	0	0
Inter-community conflict	85(340)	170(510)	0	0	850	3.33

Cut-off score =2.50(≥ 2.50 = reason for land conflict ; < 2.50 = not a reason for land conflict).

Causes of farm land conflict

Table 2 indicates that a cause of farm land conflict from all of the communities is boundary related. It implies that boundary disputes are very common between communities in Nigeria and Delta state in particular. This is congruent with Wehrmann (2008) who argues that boundary disputes are the major causes of conflicts between communities in sub-Saharan Africa. Boundary disputes are consequences of oral tradition in communities and demarcations between communities that are not physically fixed. Mustapha (2010) asserts that the conflict between Aguleri and Umuleri was boundary disputes. The undefined boundary problem emanated when fore fathers failed to show their generations the physical

boundaries between their communities. In another instance, the colonial masters who resolved such conflicts in the days of old did erected beacons, but as time went on some criminal minded persons removed them to their own advantage. This led to the situation where boundaries became difficult to identify. Boundary disputes between communities are always over common properties. Indigenes of communities tend to protect any property that is common to them, particularly if the property is crucial to their livelihood. Onwudiwe (2004), Irobi (2005), Chizea and Lyrene (2006) state that studies by scholars established nexus between scarce economic resources and inter-communal conflicts.

Table 2. Causes of land conflicts (N=255)
Çizelge 2. Arazi anlaşmazlığının nedenleri (N=255)

Causes	SA(4)	A(3)	SD(2)	D(1)	Score	Mean	Remark
Land grabbing	0(0)	0(0)	0(0)	0(0)	0	0	Not a cause
Boundary dispute	109(436)	138(414)	2(4)	6(6)	860	3.37	Cause
Discovery of Petroleum	0(0)	0(0)	0(0)	0(0)	0	0	Not a cause

Seriousness of conflict

The conflicts which took place in the communities were serious (Table 3). This means that conflicts had interrupted agricultural activities in the affected communities thereby making lands close to the boundaries and beyond to be abandoned because of fear of the unknown. This is in agreement with Otite and Albert (2001), Sambe *et al*(2013) who averred that land related conflicts in Africa and Nigeria in particular were often violent, with cost ranging from human life, loss of livestock and crops in the field. The level of seriousness of land conflicts is a reflection of the importance of land

to the people. The level of the conflicts has direct relationship with the way the people treasure land and the high value they place on it. However Singer and Small(1994) defined conflict as a major civil war if it results in at least 1000 deaths per year and if at least 5 percent of the victims originate in the groups involved in the conflicts. This implies that many violent conflicts linked to land may not qualify in this restrictive definition. However from the practical point of view, it is reasonable to adopt a broad definition of conflict since low intensity conflict may ultimately result to the outbreak of violence and it should not be overlooked.

Table 3: Perception of respondents on level of seriousness of conflicts (N=255)**Çizelge 3.** Anlaşmazlıkların ciddiyet düzeyi üzerinde katılımcıların algısı (N= 255)

				Score	Mean(x)
Very serious(4)	Serious(3)	Fairly serious(2)	Not serious(1)		
55 (220)	165 (495)	32 (64)	3(3)	782	3.07

Cut-off score = 2.50 (≥ 2.50 = serious; < 2.50 = not serious)

Level of crop production (mean annual yield in kg)

The respondents were asked to give their output figures in kilograms during the conflict period and after the conflict period, irrespective of other factors that contribute to yield because they all use either chemical or organic fertilizers or both. The climatic conditions were also stable so attention was not given to consideration of this.

There was decrease in levels of crop production of selected arable crops during the various cases of conflict (Table 4). This agrees with Uyang, Nwagbara, Undelikwo (2013) who found negative relationship between land conflict and agricultural production and consequently food security. As a result of the conflict, farmers could not go to farm regularly as they did before the conflict. In some cases, farmers abandoned

their farms for fear of being killed especially where the land conflict was very violent. Movement of food items from peaceful communities was also inhibited during conflict periods. A lot of farms were also destroyed as asserted by the respondents. However in most communities, production increased tremendously after the conflicts were resolved. This geometric increase in crop production was prompted by the level of deprivation suffered by the community dwellers during the conflict period. The implication is that they were negatively motivated to increase their efforts at farming. However, in some communities, yam, potato and maize were not planted after the conflict since cassava forms the staple crop from which staple food of the people is produced. The staple food was of most importance to them after the conflict while trying to settle down to normal activities.

Table 4: Crop production before and after land conflicts (aggregated mean) per hectare**Çizelge 4.** Arazi anlaşmazlıklarından önce ve sonra bitkisel üretim miktarı (genel ortalama) (hektar başına)

Names of Villages	Cassava(kg)	Yam(kg)	Potato(kg)	Maize(kg)
Ovre Eku				
During conflict (2012-2014)	173000	98700	10400	29500
After conflict (2015-2016)	107950	30550	8300	24800
Orogho				
During conflict (2012-2014)	69300	105000	39300	88000
After conflict (2015-2016)	48100	72000	13000	81000
Enwhe				
During conflict (2013-2015)	84000	10000	250	3000
After conflict (2016-2017)	68000	-	-	900
Igbide				
During conflict (2013-2015)	99100	8700	50	4050
After conflict (2016-2017)	56000	3000	-	800
Amai				
During conflict(2012-2013)	105700	11800	500	60100
After conflict (2014-2015)	72000	8000	-	54050
Umuebu				
During conflict (2012-2013)	133500	50800	500	73100
After conflict (2014-2015)	116000	31100	-	67000
Aladja				
During conflict (2014-2015)	91000	10000	-	2000
After conflict (2016-2017)	40000	-	-	-
Ogbe-ijoh				
During conflict (2014-2015)	15000	-	-	500
After conflict (2016-2017)	5000	-	-	-
Total				
During conflict	770600	295600	51000	260253
After conflict	513050	144650	21300	228550

Otite and Albert (2001) assert that boundary conflicts are a very crucial variable in agricultural production. According to Sambe, Avanger and Alakali(2013), Okpiliya, Ekong, and Eni(2013) several

studies on effects of inter-community land conflict on food productivity reveal that various boundary disputes prompting inter-communal conflicts have inhibited food productivity in Africa.

Effect of conflict on agriculture and related activities

Table 5 indicates that the most serious of these were displacement of farmers (mean= 3.06). destruction of crops with (mean =2.89), destruction of farm produce (mean= 2.87), disruption of farming operations (mean =2.77), stalling of transportation of farm inputs and produce to and from the communities (mean= 2.83), disruption of marketing of farm produce (mean= 2.80), inhibition of crop processing (mean= 2.88) hindering of farmers co-operate activities (mean= 2.98), loss of lives (mean= 2.71), loss of produce in storage (mean 2.91).The conflicts did not seriously affect emigration of farm labour (mean=2.40) and mobility of extension

agents(mean=2.05). These findings align with those of Sambe *et al* (2013), Nwesigye and Matsumoto (2013) in their various studies where they found that land conflict had adverse effects, ranging from destruction of crops, disruption of farming operations, inhibition of agricultural extension agents' movement, emigration of farm labour to displacement of farmers. These are the consequences of provocation. These happened because the conflicting sides were out to haul their opponents into suffering and painful situations. As this happens, both sides suffer it. This has implications for food security as the objects and activities that give rise to food security are destroyed and disrupted respectively.

Table 5. Effects of conflict on agriculture and related activities. (N=255)

Çizelge 5. Anlaşmazlıkların tarım ve ilgili faaliyetler üzerine etkisi (N=255)

Effects	SA(4)	A(3)	SD(2)	D(1)	Score	Mean(x)	Remarks
1. Destruction of crops	44 (176)	164 (492)	24 (48)	23 (23)	739	2.89	Serious
2. Destruction of farm produce	40 (160)	164 (492)	29 (58)	22 (22)	732	2.87	Serious
3. Looting of crops	11 (44)	73 (219)	100 (200)	71 (71)	534	2.09	Not serious
4. Disruption of farming operators	47 (188)	146 (438)	19 (38)	43 (43)	707	2.77	Serious
5. Inhibition of agricultural extension agent movement	9 (36)	62 (186)	118 (236)	66 (66)	524	2.05	Not serious
6. Emigration of farm labour	15 (60)	125 (375)	62 (124)	53 (53)	612	2.40	Not serious
7. Stalling of transportation of farm input and produce	41 (164)	155 (465)	34 (68)	25 (25)	722	2.83	Serious
8. Disruption of marketing of farm produce	41 (164)	158 (474)	20 (40)	36 (36)	714	2.80	Serious
9. Inhibition of crop processing	53 (212)	143 (429)	35 (70)	24 (24)	735	2.88	Serious
10. Hindering of farmers co-operative activities	53 (212)	162 (486)	23 (46)	17 (17)	761	2.98	Serious
11. Loss of lives	29 (116)	158 (474)	33 (66)	35 (35)	691	2.71	Serious
12. Loss of produce in storage	46 (184)	160 (480)	28 (56)	21 (21)	741	2.91	Serious
13. Displacement of farmers	58 (232)	170 (510)	11 (22)	16 (16)	780	3.06	Serious

Conflict management / resolution methods used

The following strategies (Table 6) were used: negotiation (mean 2.89), use of security agent (mean 2.76), intervention of government (2.95) and judicial injunction (mean 2.84).This table shows that most farmers in the communities did not agree that the use of vigilante was a strategy used for conflict management because they can also fight against the communities.

Conflict was resolved through legal procedure (mean 2.91), intervention of ministry of land and survey (mean 2.67) and intervention of land and boundary

commission (mean 2.68). Farmers in the communities were not compensated for losses of crops during and after conflict.

Differences in mean annual crops yields

The data for this information were collected from the same persons at different times, that is, during the conflict and after the conflicts.

Table 7 shows that there was significant difference in the level of crop yields before and after conflicts at 0.05 level of significance. In case of the yield of cassava, the mean value of yield (3021.96 kg) before conflict is

higher than the mean value after conflicts (2011.96 kg) with calculated t-value of 14.184 and critical value of 1.645 indicating significant difference in yield between the two periods.

Table 6. Conflict management strategies used and how the conflict was resolved. (N=255)

Çizelge 6. Kullanılan anlaşmazlık yönetimi stratejileri ve anlaşmazlıkların nasıl çözüldüğü (N=255)

Strategies of management	SA(4)	A(3)	SD(2)	D(1)	Score	Mean(x)	Remarks
1. Negotiation	43 (172)	166 (498)	20 (40)	26 (26)	736	2.89	Agreed
2. Use of security agent	37 (148)	154 (462)	30 (60)	34 (34)	704	2.76	Agreed
3. Use of vigilante group	21 (84)	121 (363)	75 (150)	38 (38)	635	2.49	Disagreed
4. Intervention of government	58 (232)	150 (450)	23 (46)	24 (24)	752	2.95	Agreed
5. Judicial Injunction	61 (244)	126 (378)	33 (66)	35 (35)	723	2.84	Agreed
Conflict Resolution							
1. Legal procedure	54 (216)	149 (447)	26 (52)	26 (26)	741	2.91	Agreed
2. Intervention of ministry of land and survey	46 (184)	123 (369)	42 (84)	44 (44)	681	2.67	Agreed
3. Compensation for losses	24 (96)	25 (75)	160 (320)	46 (46)	537	2.10	Disagreed
4. Intervention of land and boundary commission	49 (196)	117 (351)	47 (94)	42 (42)	683	2.68	Agreed

Table 7. Estimation of differences in level of crop production before and after conflicts

Tablo 7. Anlaşmazlık öncesi ve sonrası bitkisel üretim düzeylerindeki farklılıkların tahmini

Cassava yield	Individual means	Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Cassava YLD Before – Cassava YLD After	3021.96 2011.96	1010.000	1137.076	71.206	869.770	1150.230	14.184	254	.000

Yam yield	Individual means	Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Yam YLD before Yam YLD after	1156.86 567.25	589.608	875.644	54.835	481.619	697.597	10.752	254	.000

Potato yield	Individual means	Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Potato YLD before Potato YLD after	200.0000 83.5294	116.47059	423.03656	26.49158	64.29947	168.64171	4.397	254	.000

Maize Yield	Individual means	Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Maize before Maize after	1020.5882 896.27	124.31373	588.92086	36.87965	51.68487	196.94258	3.371	254	.001

There is also significant difference in the yield of yam in the pre and post conflicts periods at 0.05% level of significance. The mean yield of yam in the pre-conflict was higher than in the post conflict periods. The same trend was also found in the yield of potato and maize in the pre and post conflict periods.

The lower mean values of crop yields in the post conflict period means that the respondents had not been able to measure up to their pre-conflict farming activities and were trying to still build up their efforts. This is more so as most crops were lost to weed, pests and disease infestations and human destruction during the conflict period. The losses were prompted by failed attention to the farm as a result of fear of the unknown.

The reaction of the farmers after the conflict were congruent with Rogers (1975) protection motivation theory (PMT). It proposes a process of coping appraisal, whereby behavioural alternatives to reduce or obliterate threat are evaluated. The theory is of the proposition that an individual's intention to protect him or herself rests on four variables. These variables include the severity of the threatened event (for example violent attack); perceived vulnerability of

individuals to effects of violent conflict; the efficacy of recommended prevention behavior and perceived self-efficacy.

In order to protect themselves by ameliorating themselves from the hunger situation that was extant they (farming households) were motivated to more seriously engage in their farming activities after the resolution of the conflicts in most of the communities.

Estimation of relationship between land conflicts and routine agricultural related activities

Table 8 shows there is a significant relationship between land conflict and agricultural activities. The coefficient is -0.911, which means that land conflict affects agricultural activities negatively. As a result of land conflict, agricultural activities are disrupted. This is due to the fact that people are always afraid to go to farm especially in the boundary areas, for fear of being attacked or killed or taken hostage. This is in consonance with Mwesigye and Matsumoto (2013), Uyang *et al* (2013), Chizea and Lyare (2006), Otite and Albert (2001) who found that boundary conflicts are synonymous with disruption or inhibition of agriculture related activities.

Table 8. Relationship between land conflict and agricultural activities

Çizelge 8. Arazi anlaşmazlığı ve tarımsal faaliyetler arasındaki ilişki

			Land conflict	Agricultural activities
Spearman's rho	Land conflict	Correlation Coefficient	1.000	-.911
	Agricultural activities	Correlation Coefficient	-.911	1.000

The disruption of agricultural activities easily leads to food insecurity as food crops especially annual crops that are more speedily and adversely affected. Abandonment of farms leads to heavy weed, pest and disease infestation which are inimical to productivity of crops.

CONCLUSION

The land conflicts were caused by boundary disputes as a result of lack of physically undefined boundary. Agricultural activities were disrupted by the conflicts which were violent in nature. There were significant differences in crop production level before, during and after the conflicts. There were significant positive relationships between seriousness of land conflict and age and household size while there were significant and positive relationship between seriousness of land conflict and gender and level of formal education. There was also an inverse and significant relationship between seriousness of the land

conflict and farming activities. Land related conflicts adversely affect agricultural activities and consequently agricultural production in the study area.

In consideration of the findings, it is recommended that

- 1) Ministry of land and survey should properly demarcate and indicate the defined boundary between communities when conflict is at the stage of preamble. This should be done with the involvement of both communities sharing the boundary.
- 2) Land and Boundary Committee should be proactive when such conflicts are about to occur and wade into the issue to manage and resolve them.
- 3) Communities affected are required to contact the relevant government agencies to report any matter of disagreement relating to land boundaries with other communities.
- 4) The extension agency needs to integrate anti-conflict education in their interaction with farmers.

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