

Influence of Socio-Economic Factors on Involvement in Conflict among Natural Resources Users in Yunusari Local Government Area of Yobe State, Nigeria

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Abstract This study analyzed the socio-economic factors influencing involvement in conflict among natural resource users in Yunusari Local Government Area of Yobe State, Nigeria. Data were collected using a purposive sampling technique to select 115 crop farmers, 46 herders and 39 fisherfolks (200 respondents) with the aid of structured interview schedules. The data were subjected to both descriptive (frequency distribution, percentage and mean) and inferential (logistic regression) statistics. The results revealed that majority of the respondents were male; 99.1% crop farmers, 93.5% pastoralists and 100% fisherfolks. The study also revealed that majority (78.5%) of the crop farmers, pastoralists (76.1%) and fisherfolks (76.90%) were married. Furthermore, majority (90.4%) of the crop farmers practiced mixed cropping, 41.3% of the pastoralists practiced free range livestock management, and 48.7% of fisherfolks practiced netting fishing technique. Logistic regression analysis revealed level of education, household size and farm size as significant socio-economic factors influencing involvement in conflict among crop farmers and pastoralists. Sex, age, level of education and herd size were also significant factors influencing involvement in conflict among pastoralists and fisher folks. The result of conflict resolution mechanisms used in the study area revealed that traditional authorities were the most effective conflict resolution mechanism. The study recommended that regular review of stock routes, provision of gazetted grazing reserves, awareness campaigns to increase compliance rate to rules and regulations over conflicts on natural resources use, and conflict resolution must be developed locally.

Keywords: *conflict, involvement, natural resources, resolution, socio-economic factors*

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1. Introduction

Many countries currently face development challenges relating to the unsustainable use of natural resources and the allocation of natural wealth (United Nations Environment Programme [16]. At a basic level, tension arises from competing demands for the available natural resources. The exploitation of natural resources and related environmental stress can become significant drivers of violence [13]. Natural resources are actual or potential sources of wealth that occur in a natural state such as timber, water, land, wildlife, minerals, metals, stones and hydrocarbons [16].

Conflict is said to be unavoidable in any human society and has become a subject of controversy today among the various inhabitants of many countries, including Nigeria. Disputes flare up between farmers and pastoralists as migrating livestock herders in search of water and pasture

for their animals during dry season, would sometimes graze on farmers land and use their water points. Disputes over loss of crops and access to water, and pastoralist routes are sometimes settled by tribal leaders because the way that natural resources and the environment are governed has determining influence on peace and security. Preliminary findings from a retrospective analysis of intrastate conflicts in Nigeria over the past sixty years indicated that conflicts associated with natural resources are twice as likely to relapse in to conflict in the first five years [16].

Blench [6] observed that there exists a direct relation between population (human and livestock) and level of conflict between farmers and herdsmen. Within group: Farmer-Farmer, Pastoralist-Pastoralist, Fishermen-Fishermen or between groups: farmers-pastoralists, pastoralists-fishermen and farmers-fishermen. The most important form of tension and conflict is between groups. In the event of a conflict, people tend to go along ethnic divides. This is very evident in types of conflicts reported between

farmers and herders in different states of Nigeria [14]. The most frequent causes of conflict are those that arise as a result of crop damage caused by animals belonging to herdsman. Such conflict arise from farm encroachment on cattle routes and sometimes watering points [14].

Another dimension of conflict relates to instances where agricultural expansion includes *Fadama* land hitherto left uncultivated. Such land might have been used as dry season grazing reserves by herdsman where alternative dry season grazing resources are difficult to find. In such instances, tension could build up and serious conflict could arise [8]. The importance and utility of *fadama* land for crop and livestock farmers necessitated competition over increasing human and livestock population. Conflict in *fadama* resource can cause agricultural intensification where the existing resource is put into more intensive use by farmers (crop or livestock). Such intensification might be population driven (more person to a unit of *fadama* resources). In this case, competition becomes very stiff between different resource users (crop farmers and livestock farmers for example) which may lead to conflict. Other conflict sources include grazing of harvested crops and destruction of fishing traps by cattle herders. Conflict resulting from disputed land is hardly found in the “between groups” (Suleiman, 1998). Another notable period of conflict is at the on-set of the rainy season, where the nomadic pastoralists begin their return migration to the north [7,10,14].

Yunusari Local Government is endowed with natural resources such as rivers, flood plains, range land, arable land, fauna and flora. The area has become increasingly associated with conflict on resources-use, portending considerable threat to peace and development. In the context of the study area, conflict over the use of natural resources over years is common destructive features to agricultural production and peaceful coexistence. Some studies [4,15] have been conducted on socio-economic factors influencing involvement in conflict among natural resources users in Nigeria. However, these studies did not address how socio-economic factors influenced involvement in conflict among natural resources users in the study area. It is against this background that this study was conducted in the study area. The main objective of the study was to determine the factors that play significant roles in conflict among natural resources users in Yunusari Local Government Area of Yobe State, Nigeria. The specific objectives were to:

1. describe the socio – economic characteristics of natural resources users in the study area;
2. ascertain the perceived causes of conflict among the respondents;
3. determine the influence of socioeconomic factors on involvement in conflict among natural resources users; and
4. identify the effectiveness of conflict resolution mechanisms among the natural resources users.

2. Methodology

2.1. Study Area

The study was carried out in Yunusari Local Government Area (LGA) of Yobe State, Nigeria. It shares

border with the Republic of Niger to the north. Within the state, it shares boundary with Bursari and Geidam LGAs to the south, Yusufari LGA to the west, and Borno State to the east. It is situated between latitudes 13^o.090774 - 13^o.090963 N and longitudes 11^o.840029 - 11^o.840029 E [9]. The area has a total land mass of 3,790 square kilometers [18]. The population was projected to 486,397 for 2014 based on annual population growth rate of 3.2% [11].

The study area has a hot climate with a maximum temperature of 42°C during the month of April with a minimum of 31°C in August. Soil types include sandy loam, clay loam and sand dunes with severe desert encroachment. The annual rainfall ranges from 500mm – 700mm per annum [12]. The annual rainfall duration lasts for 3 months, and the area has international stock route of about 60 kilometers linking Niger Republic and local routes linking various grazing reserves and watering points at river Yobe [18].

The area is endowed with rangeland, arable land, streams and a river. The major occupation of the people in the area includes farming, livestock rearing, fishing and hunting among others. Both rain fed and irrigation farming are practiced in the study area. The predominant ethnic groups are Kanuri (manga), Fulani and Hausa. Major crops grown are; millet, maize, rice, wheat, cowpea, groundnut, vegetables (such as onion, pepper, tomatoes) and livestock (such as cattle, sheep and goats). Other animals kept include camels, horses and donkeys.

2.2. Sampling Procedure

Purposive sampling procedure was used to select five wards out of the 10 wards in the study area. The wards were Bultuwa Mar Yaro, Dekwa Kalisuwa, Degeltra Ngamzai, Mairari, and Mozogun Kujari. These were areas where natural resource users’ conflict predominantly occurs. This is due to the proximity of the wards to river Yobe where both rain fed and irrigated farming activities are practiced. A total of 25 communities with registered user-groups of 1,145 crop farmers, 463 livestock herders, and 389 fisher folks which summed to 1,997 user-groups used as sampling frame. The sources of information were Local Government Programme Planning Unit and Desk Office for *Fadama* III project, International Fund for Agricultural Development (IFAD) Office, Damaturu, Yobe State. Ten percent (10%) representatives were selected out of the each user group, comprising 115 crop farmers, 46 herdsman, and 39 fisher folks proportionately from the selected five wards, giving a total of 200 respondents for the study.

2.3. Sources of Data and Analytical Techniques

Data for the study were obtained from both primary and secondary sources. The primary data were collected by administering structured questionnaires/interview schedules to the farmers, fishermen and the pastoralists, while the secondary information was sourced from journals, text books, thesis, dissertations, conference papers, and the internet. Both descriptive and inferential statistics were used to analyze the data. Descriptive statistics such as

frequency distribution, percentage, and means were used to analyze the data. These techniques were used to achieve specific objectives (i), (ii), and (iv).

2.3.1. Likert Rating Scale

Possible conflict resolution mechanisms were identified and perceptions of effectiveness among the respondents were measured. These were recorded by using 5 point Likert scale rating as follows:

A. Most effective	=	5
B. Moderately effective	=	4
C. Effective	=	3
D. Least effective	=	2
E. Not effective	=	1.

2.3.2. Logit Regression Analysis

Logit Regression Model was used to analyze the influence of socio-economic factors on involvement in conflict among natural resources users and was used to capture specific objective (iii). The application of logit model in explaining socio-economic phenomenon has been shown to be more appropriate particularly in analyzing the relationship involving binary (dependent) variable and a set of independent variables [1]. The model is explicitly stated as:

$$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + e. \quad (i)$$

Where:

Y = Involvement in conflict; whether a natural resources user was involved in conflict or not (Yes = 1, No = 0)

X₁ = Sex: (Dummy, 1 for male, 0 for female)

X₂ = Age: (Years)

X₃ = Level of Education: (Number of years spent in formal education)

X₄ = Household size: (Number)

X₅ = Farm Size: (Hectares)

X₆ = Income diversification: (Dummy, 1 for diversification, 0 otherwise)

X₇ = Herd size (Number)

e = Error term.

3. Results and Discussion

3.1. Socio-Economic Characteristics of the Respondents

3.1.1. Crop Farmers

Table 1 showed dominance (99%) of male respondents in respect to crop farmers in the study area, while that of female category was only about one percent. This result indicated the presence of male dominance in terms of crop production in the study area. The Table also revealed that, majority (76.5%) of the respondents was married, while; only 23.5% were single. The study further revealed that the highest percentage of respondents were those within the age range of 41-50 years representing 33.0%, while those below the age of 20 years were the lowest which constituted 4.3%. The mean age of the respondents was 45 years. This suggests that the crop farmers were within the economically active age.

Table 1 revealed that high proportion (49.6%) of the respondents had no formal education, while the remaining percentage of the respondents had formal education from primary, secondary, with tertiary education having the least respondents with only 4.3%. Results also revealed that, the household size of respondents ranged from 5-6 persons having the highest percentage of 34.8%. The average household size was about 5.29 persons. This showed the preponderance of relatively large household size in the study area.

The result on farming experience revealed that, 21-30 years constituted the majority (55.6%), and those having the experience of 1-10 years recorded the least (4.3%). Mixed cropping was the most predominant cropping system practiced by majority (90.4%) of the respondents. Most of the respondents have augmented their income earnings as revealed by the study that those having income diversification marked the highest percentage of 76.5%, and those that have not diversified their earnings were 23.5%. This implies that the crop farmers have lesser affinity to influence conflict over crop damage or failure.

3.1.2. Pastoralists

The age distribution among the pastoralists showed that 28.3% were between 21-30 years, and 21.7% were above 50 years. The mean age of the pastoralists was 25 years. This implies that majority of the pastoralists in the study area were youths. Also illiteracy was still a common feature among the pastoralists as majority (86.9%) of the respondents had no formal education, with only about 8.7% attained tertiary education. Furthermore, the pastoralists with regards to herd size revealed that 41.3% possessed less than 50 livestock, 23.9% possessed 50-100 livestock, 13% possessed 101-150 livestock, 6.0% possessed 151-200 livestock and 15.2% possessed more than 200 livestock respectively in the study area. This implies that there is likelihood of these livestock to encroach in to farmlands and cause crop damage.

Table 1 also revealed that 19.6% of the respondents kept cattle, 6.5% kept sheep 15.2% kept camel, 19.6% kept goat, and 39.1% kept mixed flock. The mode of pastoralists' livestock management practices in the study area showed that 50.0% of the respondents practiced free range system, 11.3% practiced extensive/nomadic and 8.7% practiced intensive/confined management system respectively.

3.1.3. Fishermen

Table 1 indicated that all the respondents were male (100%), this implies that fishing is predominantly carried out by men in the study area. The Table further revealed the marital status of the respondents with high preponderance of married men (76.9%), while the single respondents had a percentage of 23.1% in the study area. Furthermore, majority (71.8%) of the respondents had no formal education, 15.4% had primary education and only 12.3% had secondary education. The study also revealed that 7.0% of the fishermen practiced hand gathering, 48.7% practiced netting and 43.6% practiced trapping fishing techniques to catch fish in the study area. With regard to years of engagement in fishing, about 10.3% (1-10 years), 17.9% (11-20 years), 64.1% (21-30 years), 2.6 (31-40 years) and 5.1% (above 40 years) were recorded in

the study area. The Table further revealed that about 92.3% of the respondents have diversified their income, while only 7.7% had not diversified their source of income. This implies that fishermen have other means of income.

Table 1. Distribution of Respondents based on Socio-Economic Characteristics (N=200)

Variables	Crop Farmers (n=115)			Pastoralists (n=46)			Fishermen (n=39)		
	Frequency	%	Mean	Frequency	%	Mean	Frequency	%	Mean
Sex									
Male	114	99		43	93.5		39	100	
Female	1	0.9		3	6.5		-	-	
Marital Status									
Married	88	76.5		35	76.1		30	76.9	
Single	27	23.5		11	23.9		9	23.1	
Age (years)			45			25			25
Less than 20 Years	5	4.3		4	8.7		8	20.5	
20-30	26	22.6		13	28.3		16	41.0	
31-40	29	25.2		8	17.4		6	15.4	
41-50	38	33.0		11	23.9		6	15.4	
Above 50 years	17	14.8		10	21.7		3	7.7	
Educational level									
No Formal Education	57	49.6		26	86.9		28	71.8	
Primary	34	29.6		14	30.4		6	15.4	
Secondary	19	16.5		2	4.4		5	12.8	
Tertiary	5	4.3		4	8.7		-	-	
Household size			5.29			7.52			3.52
1-2	26	17.4		11	23.9		11	28.2	
3-4	17	14.8		8	7.4		12	30.8	
5-6	40	34.8		2	4.3		6	15.4	
Above 6	27	23.5		25	54.3		10	25.6	
Farm size									
1-5	99	86.1		-	-		-	-	
6-10	10	8.7		-	-		-	-	
11-15	2	1.7		-	-		-	-	
16-20	4	1.7		-	-		-	-	
Above 20 hectares	-	-		-	-		-	-	
Farm experience (yrs)									
1-10	5	4.3		-	-		-	-	
11-20	42	36.5		-	-		-	-	
21-30	64	55.6		-	-		-	-	
31-40	3	2.6		-	-		-	-	
Above 40 years	1	0.9		-	-		-	-	
Types of crop grown									
Millet	9	7.8		-	-		-	-	
Sorghum	2	1.7		-	-		-	-	
Mixed cropping	104	90.4		-	-		-	-	
Herd size (Number)									
Less than 50	-	-		19	41.3		-	-	
50-100	-	-		11	23.9		-	-	
101-150	-	-		6	13.0		-	-	
151-200	-	-		3	6.5		-	-	
More than 200	-	-		7	15.2		-	-	
Type of livestock kept									
Cattle	-	-		9	19.6		-	-	
Sheep	-	-		3	6.5		-	-	
Camel	-	-		7	15.2		-	-	
Goat	-	-		9	19.6		-	-	
Mixed livestock	-	-		18	39.1		-	-	
Management practices									
Free range	-	-		-	-		-	-	
Extensive/nomadic	-	-		19	41.3		-	-	
Intensive/confine	-	-		4	8.7		-	-	
Fishing technique									
Hand gathering	-	-		-	-		3	7.0	
Netting	-	-		-	-		19	48.7	
Trapping	-	-		-	-		17	43.6	
Years engaged in fishing									
1-10 years	-	-		-	-		25	10.3	
11-20 years	-	-		-	-		7	17.9	
21-30 years	-	-		-	-		4	64.1	
31-40 years	-	-		-	-		1	2.6	
Above 40 years	-	-		-	-		2	5.1	
Income diversification			57.51			22.01			19.50
Yes	88	76.5		29	65.9		36	92.3	
No	27	23.5		15	34.1		3	7.7	

Table 2. Perceived Causes of Conflict among the Respondents (N=200)

Causes of Conflict	Most Important		More Important		Less Important	
	Frequency	Per. (%)	Frequency	Per. (%)	Frequency	Per. (%)
Encroachment into farmlands	184	92.00	16	8.00	0	0.00
Increase in population of livestock	169	84.50	24	12.00	7	3.50
Increase in human population	181	90.50	19	9.50	0	0.00
Lack of effective mechanism for Conflict management	96	48.00	14	7.00	90	45.00
Non observance of rules and Regulations	166	83.00	34	17.00	0	0.00
Blockage and reduction in size of Stock route	144	72	31	15.50	25	12.50
Land tenure and land use practices	120	60.00	18	9.00	62	31.00
Desert encroachment	143	71.50	37	18.50	0	0.00
Disagreement over access to irrigation water	101	50.50	83	41.50	8	4.00
Poor state of the existing grazing Reserve	165	82.50	31	15.50	4	2.00
Inadequate existing grazing reserve	124	62.00	71	35.50	5	2.50
Commercialization of crop residues	116	58.00	70	35.00	14	7.00
Destruction of fishing gears in ponds by herders	122	61.00	70	35.00	8	4.00
Over fishing	24	12.00	2	1.00	174	87.00
Use of illegal technique to catch fish	9	4.50	24	12.00	167	83.50
Membership of different political party	107	53.50	6	3.00	87	43.50
Religious factors	17	8.50	2	1.00	181	90.00
Cultural/tribal differences	117	58.50	24	12.00	59	29.50
Type of leadership in local community	137	68.50	41	20.50	22	11.00
Poverty	124	62.00	62	31.00	16	8.00
Lack of income generating activities	119	59.50	71	35.50	10	5.00

Source; Field Survey, 2015.

3.2. Perceived Causes of Conflict among Respondents

Table 2 showed the respondents' perception on causes of conflict. The study revealed that majority (92%) of the respondents regarded encroachment into farm lands as the most important cause of conflict, and 72% of them regarded blockage and reduction in the size of stock route as the most important cause of conflict. This was in line with the findings of MAFR [9] which reported that the issues of encroachment on grazing reserves, blockage or narrowing of stock routes all over by farmers without permission. In the same vein, Wasaram [17] reported that sometimes farmers who had poor harvests, deliberately leave the crop unharvested on the farm, hoping that pastoralists will graze them, then institute a court action, expecting heavy compensation consequently leading to conflict. Also, majority (82.5%) of the respondents agreed that poor state of the existing grazing reserves as most important cause of conflict, and 68.5% opined that type of leadership in the local community as the most important cause of natural resource conflict in the study area. This is not surprising, because the crop farmers and pastoralists have for long been engaged in accusations and counter-accusations over the use of arable land [1].

3.3. Influence of Socio-economic Factors on Involvement in Conflict among Crop Farmers and Pastoralists

3.3.1. Sex

Table 3 revealed that the coefficient of sex was significant ($P \leq 0.01$) and negatively related to respondents' involvement in conflict over the use of natural resources. This implies that the male pastoralists and fisher folks were more likely to be involved in conflict over natural resources than the females.

3.3.2. Age

Table 3 also indicated that the coefficient of age was negative and significant ($P \leq 0.05$). The age variable has a negative coefficient suggesting that the involvement in conflict was low among older farmers than young crop farmers and pastoralists over the use of arable land and pasture. This corresponds with the findings of Benishiekh [4] who reported that majority of farmers were 35 years old and below. Blench (2010) and Adisa [2] also observed that young pastoralists are highly vulnerable to influence conflict over access to pasture land.

3.3.3. Educational Level

The coefficient of educational level was negative and significant ($P \leq 0.05$) among crop farmers and the pastoralists. This result implies that literacy level among the respondents was low; therefore, they are highly vulnerable to influence conflict over natural resources.

3.3.4. Household Size

The coefficient of the household size was found to be negative and significant ($P \leq 0.01$). The negative coefficient of the household size suggests that involvement in conflict among large households was higher than those of the small sized households. This was in conformity with the findings of Benishiekh [4] who observed that the coefficient of household size negatively affected the involvement in conflict among arable crop farmers and pastoralists, suggesting that age and house hold size did not discourage the involvement in conflict among farmers and pastoralists.

3.3.5. Farm Size

The farm size coefficient was negative and significant ($P \leq 0.01$) to involvement in conflict among the respondents. This implies that there was likelihood for

stray livestock trespassing into farm lands thereby resulting in conflict. Also, this supports the findings of Wasaram [17] who opined that Borno State has a sizeable land area as grazing reserves which were turned in to farm lands, thus, it becomes necessary for livestock to move between potential farms in search of feed, thereby resulting to clash with farmers.

3.4. Influence of Socio-economic Factors on Involvement in Conflict among Pastoralists and Fisher Folks

3.4.1. Sex

Table 3 revealed that the coefficient of sex was found to be significant at 5% ($P \leq 0.05$) level and negatively related to the probability respondents' involvement in conflict over the use of natural resources. This implies that the male pastoralists and fisherfolks were more likely to be involved in conflict over natural resources than the female ones.

3.4.2. Age

The age coefficient was negative and significant ($P \leq 0.01$) among the respondents on involvement in conflict. The negative coefficient of age, suggesting that involvement in conflict was lower among the old than young respondents in the study area. This conforms to the findings of blench [5] and Sulaiman [14] who opined that youths were highly involved in most of the conflicts over the use of natural resources.

3.4.3. Level of Education

The result indicates that level of education of the respondents was not significant ($P \leq 0.05$) but negatively related to involvement in conflict. The negative coefficient implies that the involvement in conflict among the respondents is a determining factor.

3.4.4. Herd Sizes

The coefficient of the herd size was found to be significant ($P \leq 0.05$) and negatively related to the involvement in to conflict among the respondents. The negative coefficient of the result implies that involvement in to conflict is influenced by herd size. And this conformed to Blench and Hassan [5] who observed that herd size was a significant factor to conflict causation.

3.4.5. Income Diversification

The coefficient of income diversification was significant ($P \leq 0.05$) and negatively related to the involvement in confluent over natural resources among the respondents. This conforms with the *a priori* expectation that negative coefficient of the income diversification variable is negatively related to involvement in to resource use conflicts.

3.5. Effectiveness of Conflict Resolution Mechanisms among Natural Resources Users

3.5.1. Effectiveness of Conflict Resolution Mechanisms among Crop Farmers

Table 4 indicated that, traditional authorities (village elders, ward heads, village heads and district heads) were the most effective mechanisms for conflict resolution in the study area. The results revealed that majority (99.10%) of the respondents opined that traditional authorities were the most effective mechanisms in conflict resolution. The study further revealed that Local Government Authority is a moderately effective mechanism for resolving conflict among respondents in the study area. This is because; results revealed that 72.2% opined that Local Government Authority is a moderate mechanism for solving conflict among crop farmers. The study also revealed that State Government Authority is a moderately effective mechanism for resolving conflict among respondents in the study area. This is because; the results revealed that 76.50 % of the respondents opined that State Government Authority is a moderate mechanism for resolving conflict among crop producers in the study area.

The results further revealed that, practicing farmers association is a moderately effective mechanism in resolving conflict among the crop farmers in the study area. To buttress these facts, highest percentage (69.6%) of respondents opined that practicing farmers association is a moderately effective mechanism of resolving conflict among crop farmers in the study area. The study further revealed that *Fadama* users association plays an important role in resolving conflict among respondents in the study area. Table 4 further indicated that, *fadama* users association is the most effective mechanism with 59.1% used in resolving conflict among the respondents.

Table 3. Logistics Regression Estimate of Socio- Economic Factors influencing Conflict among the respondents

Variables	Crop farmers Vs Pastoralist		Pastoralists Vs fishermen	
	Coefficient	T – Value	Coefficient	T – Value
Sex	-0.965268	-2.54***	-0.9952378	-2.56***
Age	-0.179655	-2.28**	-0.0342505	-3.14***
Educational level	-0.2676053	-3.41***	-0.0154818	-3.20**
Household size	-0.0274769	-4.41***	.32283	1.06
Farm/herd size	-0.3521924	-3.01***	-0.084387	-2.33**
Income diversification	-0.0000841	-1.64NS	-0.0000863	-1.63
Constant	10.36017	3.31***	1.901803	1.86**

Source: Regression Extract, 2015

*** Significant at 1%

** Significant at 5%.

The study further revealed that young farmers club plays moderate role in resolving conflict among respondents in the study area. The study indicated that, young farmers club is a moderately effective mechanism with 61.7% of the respondents used in resolving conflict among in the study area. Results also revealed that, Miyetti-Allah cattle Breeders Association is also a moderate conflict resolution mechanism. To buttress this fact, most of the respondents with a 66.1% opined that Miyetti-Allah Cattle Breeders Association is a moderately conflict resolution mechanism among crop farmers in the study area.

3.5.2. Effectiveness of Conflict Resolution Mechanisms among Pastoralists

Table 5 indicated that, traditional authorities (village elders, ward heads, village heads and district heads) are the most effective (100%) mechanisms for conflict resolution in the study area, that is all the respondents opined that traditional authorities are the most effective mechanisms. The results revealed that police/court is not an effective (97.80%) mechanism in resolving conflicts among the crop farmers in the study area. The results further revealed that majority (97.7%) of the respondents agreed that army is not an effective mechanism in solving conflict among the pastoralists in the study area. The study further revealed that local government authority is not an effective (82.60%) mechanism for resolving conflict over

natural resources among respondents in the study area.

The study also revealed that State government authority is a moderately effective (56.50%) mechanism for resolving conflict among respondents in the study area. Results further revealed that, practicing farmers association was also a moderately effective (63.00%) mechanism in resolving conflict among the crop farmers in the study area. The study further revealed that *Fadama* users association plays an important role in resolving conflict among respondents in the study area. Analysis indicated that, *fadama* users association is a moderately effective (65.2%) mechanism used in resolving conflict among the respondents in the study area.

The study further revealed that most (47.80%) of the respondents opined that young farmers club plays most effective mechanism for resolving conflict among respondents in the study area. While, 37.0% of respondents opined that young farmers club is moderately effective mechanism in resolving conflict among the respondents in the study area. The results revealed that, Miyetti-Allah cattle Breeders Association is also a moderate (60.90%) conflict resolution mechanism. The study further revealed that Alhaya Cattle Breeders played an important role in resolving conflict among respondents in the study area. The results indicated that Alhaya Cattle Breeders Association was most effective (71.70%) mechanism to resolve conflict among the natural resource users in the study area.

Table 4. Effectiveness of Conflict Resolution Mechanisms among Crop Farmers (n=115)

Conflict resolution mechanism	Most Effective		Moderately effective		No Idea		Least effective		Not effective	
	Freq	Per (%)	Freq	Per (%)	Freq	Per (%)	Freq	Per (%)	Freq	Per (%)
Traditional authorities	114	99.10	-	-	-	-	-	-	1	0.90
Police/Court	1	0.90	2	1.90	-	-	-	-	112	97.40
Army	-	-	1	0.90	-	-	-	-	114	99.10
Local Government	18	15.70	83	72.20	3	2.60	2	1.70	9	7.80
State Government	15	13.00	88	76.50	3	2.60	2	1.70	7	6.10
Practicing farmer Ass,	32	27.80	80	69.60	-	-	3	2.60	-	-
Fadama Users Ass.	68	59.10	34	29.60	10	8.70	3	2.60	-	-
Young Farmers Club	43	37.40	71	61.70	1	0.90	-	-	-	-
Miyetti Allah Cattle breeders Association	36	31.30	76	66.10	-	-	3	2.60	-	-
Alhaya Cattle Breeders	14	12.20	96	83.50	4	3.50	-	-	1	0.90

Source: Field survey, 2015.

Table 5. Effectiveness of Conflict Resolution Mechanisms among Pastoralists (n=46)

Conflict resolution mechanism	Most Effective		Moderately effective		No Idea		Least effective		Not effective	
	Freq	Per (%)	Freq	Per (%)	Freq	Per (%)	Freq	Per (%)	Freq	Per (%)
Traditional authorities	46	100	-	-	-	-	-	-	-	-
Police/Court	-	-	1	2.20	-	-	-	-	45	97.80
Army	-	-	-	-	-	-	3	2.30	43	97.70
Local Government	4	8.70	2	4.40	-	-	-	-	38	82.60
State Government	3	6.50	26	56.50	17	37.00	-	-	-	-
Practicing Farmers Association	6	13.10	29	66.00	6	13.10	5	10.90	-	-
Fadama Users Association	-	-	30	65.20	16	34.80	-	-	-	-
Young Farmers Club	6	13.10	82	47.80	-	-	11	24.00	7	15.20
Miyetti Allah Cattle breeders Association	13	28.30	33	71.70	-	-	-	-	-	-
Alhaya Cattle Breeders	29	63.00	17	37.00	-	-	-	-	-	-

Source: Field survey, 2015.

Table 6. Effectiveness of Conflict Resolution Mechanisms among Fishermen (n=39)

Resolution mechanism	Most Effective		Moderately effective		No Idea		Least effective		Not effective	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
Traditional authorities	36	92.30	1	2.70	-	-	-	-	2	5.10
Police/Court	-	-	4	10.30	1	2.60	6	15.40	28	71.80
Army	2	5.10	4	10.30	3	7.70	-	-	30	76.90
Local Government	6	15.40	29	74.40	-	-	-	-	4	10.40
State Government	4	10.30	32	82.10	1	2.60	1	2.60	1	2.60
Practicing farmers Association	5	12.80	29	74.40	2	5.70	-	-	3	7.70
Fadama Users Association	24	6.50	14	35.90	1	2.60	-	-	-	-
Young Farmers Club	6	15.40	30	76.90	3	7.70	-	-	-	-
Miyetti Allah Cattle breeders Association	4	10.30	29	74.40	6	15.40	-	-	-	-
Alhaya Cattle Breeders	4	10.30	21	53.80	11	28.20	-	-	3	7.70

Source: Field survey, 2015.

3.5.3. Effectiveness of Conflict Resolution Mechanisms among Fisherfolks

Table 6 indicated that, traditional authorities (village elders, ward heads, village heads and district heads) were the most effective (92.00%) mechanisms for conflict resolution in the study area. The results revealed that, police/court is not an effective (71.80%) mechanism in resolving conflict among the fishermen in the study area. The study further revealed that majority (76.90%) of respondents agreed that army is not an effective mechanism in solving conflict among fisher folks in the study area. The study further revealed that Local Government Authority is a moderately effective (74.40%) mechanism for resolving conflict among respondents in the study area. The study also revealed that State Government Authority is a moderately effective (82.10%) mechanism for resolving conflict among respondents in the study area.

Result from Table 6 revealed that, practicing farmers association is a moderately effective mechanism in resolving conflict among the fisher folks in the study area. To support these facts, highest percentage of respondents 74.4% with a frequency of 29 agreed that practicing farmers are moderately effective mechanisms of resolving conflict among fisher folks in the study area. The study further revealed that *Fadama* users association plays an important role in resolving conflict among respondents in the study area. Result of analysis indicated that, *fadama* users association is the most effective mechanism with a frequency of 24 (61%) use in resolving conflict among the respondents in the study area. The Miyetti-Allah Cattle Breeders Association is also a moderate conflict resolution mechanism. To buttress this fact, most of the respondents (74.4%) responded that Miyetti-Allah Cattle Breeders Association is a moderately conflict resolution mechanism among respondents in the study area.

4. Conclusion

The study revealed that access to natural resources constituted an obstacle to pastoralists, as majority of the respondents revealed that they have no access to stock routes and pasture lands in the study area. The study further revealed that encroachment into farmlands as the

most important cause of conflict followed by blockage and reduction in the size of stock routes. The study revealed significant relationship between the selected socio-economic variables and involvement in conflict among the respondents. The study further revealed that traditional authorities were the most effective mechanisms for conflict resolution. The study established that the most important variables of conflicts among the respondents were environmental, psychological, political, population and economic factors.

5. Recommendations

The following recommendations were proffered, based on the findings of the study:-

1. To reduce conflicts among farmers, pastoralists and fisher folks, both the state Government and Local Government councils should survey, demarcate, beacon and gazette all existing grazing reserves and stock routes in the study area. This is for prevention of encroachment into farmlands and grazing reserves by the herders and the farmers respectively. The state must, on one hand, promote and guarantee the use and access rules deemed acceptable to all stakeholders.
2. A Three-stage, statutory conflict management framework with committees at community, Local and State Government levels that would incorporate all stakeholders should be implemented especially for prevention and resolution of natural resources-based conflicts.
3. There is need for strengthened educational interventionist role of the extension service to reduce farmer-herdsmen- fisher folks conflicts in the study area.
4. As a matter of utmost importance, exploring better involvement of indigenous resource user-groups in the management and utilization of natural resources.
5. Traditional and other local institutions should be encouraged to be more responsive to the plight of victims of farmers-herders, fisherfolks conflicts by using appropriate mechanisms at their disposal for effective resolution and management of conflict.

References

- [1] Adisa, R. S., and Adekule, O. A. (2010). Farmer-Herdsmen Conflicts: A Factor Analysis of Conflict Variables among Arable Crop Farmers in North Central Nigeria. *Journal of Human Ecology*, 30(1), 1-9.
- [2] Adisa, R.S. (2011). Management of Farmer-Herdsmen Conflicts in Nigeria: Implications for Collaboration between Agricultural Extension Service and Other Stakeholders. *Journal of International Agricultural and Extension Education*, 18(1), 60-72.
- [3] Ajuwon, S. S. (2010). Analysis and Managing Potential Conflict: Case Study of Fadama Project in Nigeria. *Journal of International Agricultural and Extension Education*, pg 62-71.
- [4] Benisheikh, K. (2006). An Analysis of Conflict between Farmers and Pastoralists in Borno State, Nigeria. Unpublished M.Sc Dissertation, Department of Agricultural Economics and Extension, University of Maiduguri, Borno state, Nigeria.
- [5] Blench, R. M. and Hassan, U. (2003). *Report on Fadama User Conflicts in Taraba, Borno, Gombe and Bauchi States*. Unpublished report to the World Bank Post-Conflict Fund.
- [6] Blench, R.M. (2010). Conflict between Pastoralists and Cultivators in Nigeria. *A Review paper prepared for DFID, Nigeria*, Kay Williamson Educational Foundation 8, Guest Road Cambridge CB1 2AL United Kingdom.
- [7] Fiki, C. and Lee, B. (2004). Conflict Generation, Conflict Management and Self-organizing Capabilities in Drought-prone Rural Communities in North-eastern Nigeria: A case study. *Journal of Social Development in Africa*, 19(2): 25-48.
- [8] Gefu, J. O. and Kolowole, A. (2005). Conflict in Common Property Resources use: Experiences From an Irrigation Project. Bauchi State Agricultural Development Programme, Desk Officers Training Workshop, August 23-28. P.g 25.
- [9] MAFR (2004). Ministry of Animal and Forest Resources. Yobe State, Nigeria, Annual Report.
- [10] Ministry of Land and Survey (2008): Catography Development, Yobe State, Damaturu, Nigeria.
- [11] National Population Commission (2006). Population Census Data Borno State, Nigeria Federal Republic of Nigeria Official Gazette, National and State Provision Census. Printed and Published in 2007 by the Federal Government Printer, Lagos Nigeria.
- [12] Nigerian Metrological Agency (2011). Yearly Rainfall and Temperature Data. Maiduguri International Airport, Borno State of Nigeria.
- [13] Shettima, A.G., and Tar, U.A., (2008). Farmer-Pastoralist Conflict in West Africa: Exploring the Causes and Consequences. Information, Society and Justice, Volume 1.2, Pp. 163-184.
- [14] Suleiman, A.B. (1998). Farmer-Grazier conflict. An Overview for Consideration and Intervention. A paper presented at the at 28th regular session of the National Council on Agriculture. Sokoto State, Nigeria, 26-31st March.
- [15] Sulaiman, A. and Ja'afar, M. R. (2010). Economic effect of farmers-graziers' conflict in Nigeria: A case study of Bauchi State. *Trend Agric. Econ.*, 3: 147-157.
- [16] United Nation Environment Programme(UNEP) (2009). From Conflict to Peacebuilding. The Role of Natural Research and the Environment.
- [17] Wasaram, A. A. (2001). Memorandum on the Perennial Conflict between Crop Farmers and Pastoralists. *A Paper Presentation Submitted to 31st Regular Meeting of National Council on Agriculture*, Oweri, Imo State, Nigeria.
- [18] YOSADP (2008). Report on the Village Listing Survey of Damaturu, Yobe State Agricultural Development Project. Prepared by Planning, Monitoring & Evaluation Department (YOSADP) Damaturu, Yobe State, Nigeria.