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INFLUENCE OF COUNTY GOVERNMENT MITIGATION STRATEGIES ON SUSTAINABILITY OF FOOD SECURITY IN TURKANA COUNTY, KENYA

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ABSTRACT

Persistent in food insecurity in Turkana County motivated this study to investigate influence of county government mitigation strategies on sustainability of food security in Turkana County, Kenya. The study was based on exploratory research design and targeted 113 respondents comprised of Sub county, ward and village administrators, agricultural officers and program officers of NGOs in the County. Primary data was collected by means of self-administered structured questionnaires. A pilot study was done in Baringo County where 10 respondents were selected to participate in the pilot study. Descriptive analysis such as frequencies, percentages, means, and standard deviation were utilized whereas inferential statistics assessed nature and the strength of the relationships. Analyzed data was presented in tables. SPSS version 24 computer software was used to compute statistical data. A total of 82 respondents out of the sampled 89 respondents returned completely filled questionnaires representing a response rate of 92.1%, thus good for generalizability of research findings to a wider population. The study findings revealed that conflict resolution strategy, agricultural production strategy and community coping strategy had positive (while relief food distribution strategy had negative) significant influence on sustainability of food security in Turkana County, Kenya. The study concluded that one; peaceful conflict resolution in Turkana County is a mandatory strategy to enable community members peacefully settle down and engage in farming activities that can foster sustainable food security in Turkana County and two; the agricultural production strategy as envisaged in the current County investment strategic plan can enhance sustainable food security in Turkana County if achievably implemented. The study recommended that Turkana county government in liason with the local community leaders should craft feasible conflict resolution strategies that can promote peaceful co-existence among all communities and attract investors in agribusiness activities. The Turkana county government should practically implement the agricultural production strategy as envisaged in the Turkana County Investment Plan (2016-2020); so as foster sustainable food security in the county.

Key Words: *Conflict Resolution, Agricultural Production, Relief Food, Community Coping, Food Insecurity*

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INTRODUCTION

Food security is defined as, "Access by all people at all times to enough food for an active healthy life" (Ellis, 2007). The World Food Summit in 1996 reaffirmed that food security can only exist when all people, at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. At the macro level, it implies that adequate supplies of food are available through domestic production or through imports to meet the consumption needs of all people in a country. At the micro level (household or individual), food security depends on a number of factors which are related, for the most part, to various forms of entitlements to income and food producing assets, as well as the links between domestic and external markets and the transmission effects, from the latter, on small, low-income and resource-poor producers and consumers. Food security is not therefore just a supply issue but also a function of income and purchasing power, hence its strong relationship to poverty (FAO, 2015).

Kenya, for a long period, pursued the goal of attaining self-sufficiency in key food commodities that included maize, wheat, rice, milk and meat. Self-sufficiency in maize was achieved in a very few years during the 1970s when production was so high that some was exported. Unfortunately, attainment of self-sufficiency did not automatically imply that household food security was achieved. Evidence shows that solving the food security issue from the production (supply-side) point of view, while overlooking the demand side, do not solve the food security problem, particularly the access of vulnerable groups to sufficient food (FAO, 2015).

In 1986, Kenya shifted from a food self-sufficiency goal to an outward strategy by identifying seven commodities that form the core of its current food and agricultural policy. These are maize, wheat, meat, milk and horticultural crops for both home consumption and export markets, and coffee and tea for raising farm income and earning foreign exchange. The strategy aimed to achieve multiple objectives, including family and national food security, foreign exchange earnings, government revenue, employment, regional balance and generation of new income streams for rural people (Eicher, 2008). This strategy continues to be valid. It can thus be concluded that self-sufficiency and expansion of exports are the main objectives of the Government in the agriculture sector.

In regard to Turkana County, the study area; Turkana is hot and dry for most part of the year. Average rainfall in the plains is about 300- 400 mm falling to less than 150mm in the arid central parts. Rainfall is erratic and unreliable and famine is a constant threat. Turkana has a very poor agricultural potential and is only suitable for extensive rearing of indigenous livestock. The urban population has no real economic alternatives for survival. Due to low productivity of the rangelands and the high variation of rainfall, pastoralists are forced to move frequently from one place to another to search for water and pastures. Yet this movement has to be carefully calculated and monitored due to security situation. Relatively safe areas in the central parts of the have high concentration of pastoralists as compared to Northern, North-Western and Southern areas, which are prone to armed conflicts and cattle raids (FAO, 2015).

Globally, food insecurity that has web-caught the world since 2007 has exacerbated these causes and factors of food insecurity, although it has also provided Africa with an opportunity to find long-term solutions to hunger through agriculture led growth. Approximately 1 billion people - or one sixth of the world's population subsist on less than $1 per day, 162 million of them having less than $0.50 per day. Between March 2007 and March 2008, global food prices increased an average of 43 per cent (FAO, 2015).

The Government of Kenya's policy is to ensure that the whole population is food secure at all times and that FFA should be used as the main food assistance strategy as much as possible. The Food For Assets

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(FFA) project selection is in line with Vision 2030 and the Poverty Reduction Strategy Paper (PRSP) with the key objective of enhancing food security in the respective hunger stricken Districts in the country. Food For Assets activities are also in line with the Agricultural Sector Development Strategy (2009-2020) and the draft ASAL Policy documents especially as they relate to Natural Resource and environmental management.

Turkana County is the second largest of the forty seven (47) counties in the Republic of Kenya, covering an area of 77,000 square kilometres, accounting for 13.5% of the total land area in Kenya. The County lies between Longitudes 340 30' and 360 40' East and between Latitudes 10 30' and 50 30' North. The County is located in the north-western most county in Kenya. It is bordered by the countries of Uganda to the west; South Sudan and Ethiopia, to the north and northeast; and Lake Turkana to the east. To the south and east, neighbouring counties are West Pokot, Baringo and Samburu Counties, while Marsabit County is located on the opposite (eastern) shore of Lake Turkana. Its administrative headquarters and largest town is Lodwar (Turkana County Investment Plan 2016 – 2020).

Objectives of the study

The general objective of the study was to investigate influence of county government mitigation strategies on sustainability of food security in Turkana County, Kenya. The specific objectives were;

- To determine the influence of county conflict resolution strategy on sustainability of food security in Turkana County
- To determine the influence of county agricultural production strategy on sustainability of food security in Turkana County
- To determine the influence of county relief food distribution strategy on sustainability of food security in Turkana County
- To determine the influence of county community coping strategy on sustainability of food security in Turkana County

The following null hypotheses guided the study;

H_{01}: County conflict resolution strategy does not significantly influence sustainability of food security in Turkana County.

H_{02}: County **a**gricultural production strategy does not significantly influence sustainability of food security in Turkana County.

H_{03}: County **r**elief food distribution strategy does not significantly influence sustainability of food security in Turkana County.

H_{04}: County community coping strategy does not significantly influence sustainability of food security in Turkana County.

LITERATURE REVIEW

Marxian conflict theory

This is a theory by Karl Marx in 1971, which sets off with the idea that there are two basic groups of people within society - the wealthy and the poor. This theory looks at what happens when one group attempts to rebel against the other group and the various roles a group of people (or one person) has over another group of people. The theory analyses the social control that the rich have over the masses.

Coping theory

The proponents of this theory were Zeidner and Endler (1996) and the theory states that in the presence of stressors, people tend to develop skills to help them adjust to the life stressors. That is, the theory has its origins in psychoanalytic theories of unconscious defense mechanisms, whereby, coping is a dynamic process, which involves a series of reciprocal responses between individuals and the environment.

Therefore, by applying coping theory to the impact of community-led strategies on conflict resolution and peace building among pastoral communities in Turkana County, this theory would argue that when communities are hit by conflict, such communities

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would respond by adjusting to the stress caused by the conflict. The theory would see the use of community-led strategies for conflict resolution and peace building as a response and a coping mechanism to the stress that results from the conflict and its associated effects. The theory would also argue that the success of the community-led strategies in helping resolve the conflict and to bring about peace will be dependent on personal characteristics of the persons involved in the strategies, situational demands, and even the social and physical characteristics of the setting (Zeidner & Endler, 1996).

Program theory

This is a theory by Bickman (1985) was formulated to ascertain the theoretical sensibility of a development program and involves the mechanisms that mediate between the delivery and receipt of the program and the emergence of outcomes of interest. Thus a program theory consists of a set of statements that describe a particular program, explain why, how, and under what condition the program effects occur, predict the program outcomes, and specify the requirements necessary to bring about the desired program effects). The program theory therefore has three components; the program activities or inputs, the intended outcome or outputs and the mechanisms through which the intended outcomes are achieved.

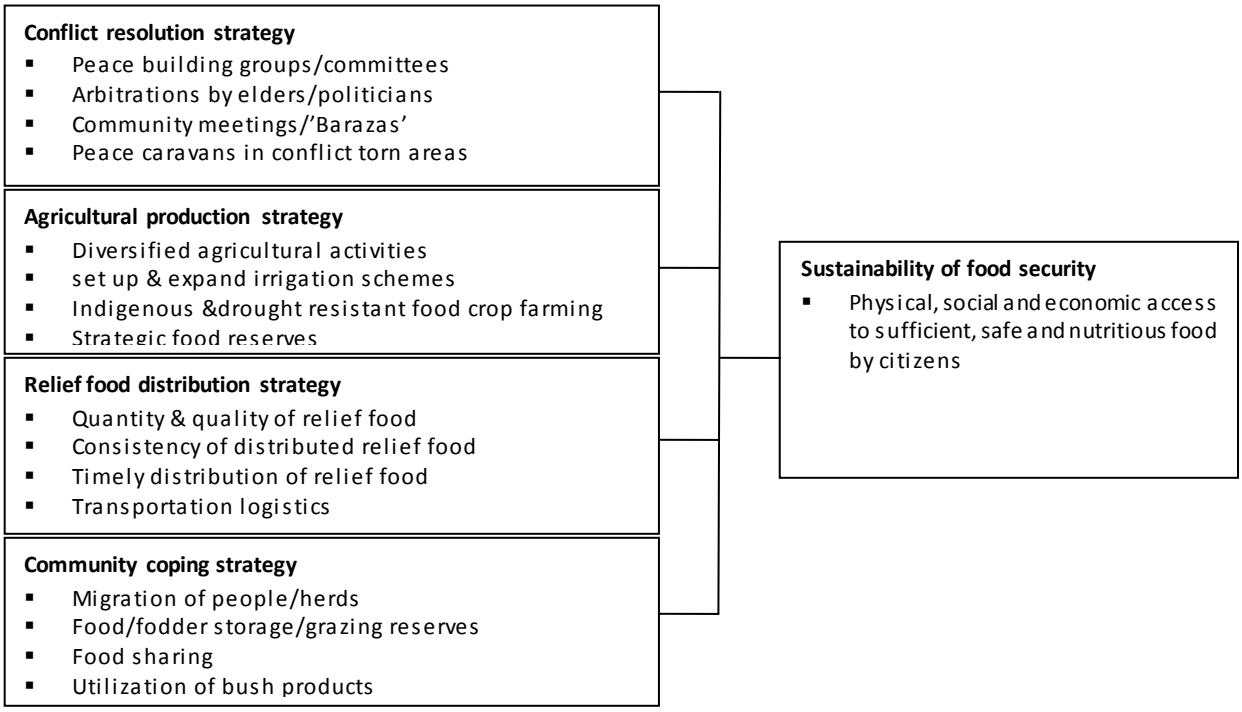

Figure 1: Conceptual Framework

Empirical review of related literature

First, Mkutu (2013) observed that there are many factors contributing to the risk of violent conflicts involving pastoralists which include; a challenge with land use as a result of most agricultural land being sub-divided into very uneconomical units which cannot adequately support households; dry rivers, hence no water for pastoralists who have to compete for the dwindling water resources; nomadic pastoralism; cattle rustling and banditry. These conflicts definitely have a negative bearing on both human food and livestock pasture, since residents cannot settle down to do farming and also provide a hostile environment for investors in food security.

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Ho-Won Jeong (2008) states that in coping with conflict, people employ particular styles, strategies, and tactics and that a strategy serves as an overall plan for responding to a given situation and that adoption of particular strategies is influenced by different styles and attitudes towards conflict; thus identifies four conflict management styles namely; avoidance (discussion about issues is suppressed so long as the weaker party remains subordinate.), contending (scoring a victory and defeating the other party by attempting to prove how wrong they are), yielding (one party offers unilateral concessions by taking the others perspectives or interests more seriously than one's own) and accommodating (involves parties to a conflict searching and locating options that gratify mutual goals-no winner or loser).

Further reduced food production in the arable farming areas implies that there is less food available in the markets thus raising the prices of the available food making it out of reach for the poor. Floods also hamper pastoralists' access to food by making it impossible to move food from the food surplus areas to food deficit areas. Food crisis occasioned by ecological disasters are not new in Kenya. In the past one century or so, Kenya is reported to have experienced close to 20 major droughts with varying magnitudes and spatial concentration which definitely affect agricultural production activities (Bates, 2005).

As far as food distribution is concerned, there has been evidence of the politicization of food assistance, with political leaders, local elites and local relief committees influencing who received assistance. There were risks and pressures in recruitment either due to internal pressures to employ staff from certain communities, or due to political interference in food distribution. Most complaints from beneficiaries were related to targeting and inconsistency in the timing of food distributions. There were also risks and challenges regarding transportation partly due to political influence in the trucking companies, and due to transportation costs not being adequately resourced by the Government, which increased the likelihood of food rations being looted and sold or both as a form of payment. These risks are exacerbated in the drought response by broader challenges at the macro level (Transparency International, 2014).

More so, evidence from literature shows there were failures to respond to early warning, which ultimately led to a late, rushed and politically pressurized response in Kenya. This meant that some organizations struggled to put strong procedures in place in the time available, heightening the risks of corruption and diversion. It also meant that there were greater challenges to scaling up and ensuring the availability of adequate resources to manage and monitor the quality and effectiveness of the response. Echoing previous years, there were also questions regarding why the ASALs have not seen greater investments in risk-reduction measures to reduce the need for more costly emergency responses (Save the Children, 2014).

According to Kenya;s vision 2030 blueprint, communities, in hunger stricken areas resort to their own coping strategies in order to fight hunger. Community strategies are referred to as: “bottom-up strategies”, "strategies from below or “internal strategies”. The local community has a role to play by providing cooperation, participation, ownership, and cost- sharing, either in cash or kind. They should also be involved throughout the whole process of fighting hunger and achieving sustainable food security. Internally developed strategies are self-perpetuating and enjoy support and participation from the affected community members. The community has ownership and hence feels obliged to sustain them.

METHODOLOGY

In this study, descriptive research design was employed. The study targeted 113 respondents comprising of mainly the 7 Sub county administrators of Turkana central, Turkana south, Turkana east, Turkana north, Turkana west, Loima

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and Kibish; 30 ward administrators representing the 30 wards (Lodwar Township, Kanamkemer, Kerio Delta, Kang'atotha, Turkwel, Kalokol, Nakalale, Kaeris, Kaaleng / Kaikor, Lapur, Lake Zone, Kibish, Kainuk, Kaputir, Katilia, Katilu, Lokichar, Loima, Lorugum, Lokiriama/Lorengipi, Naanam, Kakuma, Lokichoggio, Songot, Kalobeyeyi/Oropoi, Letea, Kalapata, Lobeyi / Kotaruk, Lokori, and Kapedo); 30 village administrators, 25 agricultural officers from sub county and county levels; plus 21 selected program officers from multinational organizations such as UNICEF, WFP, FAO, OXFAM,UNDP, Kenya Red cross society, Child Fund, World Relief, The Salvation Army, Diocese of Lodwar among others. The study employed stratified random sampling technique to guide how sampled officials (Sub county administrators, Ward administrators, Agricultural officers, village administrators and program officers) were selected. Primary data was collected by means of self-administered structured questionnaires. All collected data was coded, cleaned, tabulated and analyzed using descriptive and inferential statistics with the aid of specialized Statistical Package for Social Sciences, version 24. Study statistical model used was as below.

$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

y = Sustainability of food security in Turkana County.

β_0 = Constant

X_1 = Conflict resolution strategy

X_2 = Agricultural production initiatives strategy

X_3= Relief food distribution strategy

X_4 = Community coping initiatives strategy

$\{\beta_0\text{-}\beta_4\}$ = Beta coefficients

ε = the error term

RESULTS

Conflict resolution and sustainable food security

This assessed the influence of conflict resolution strategy on sustainability of food security in Turkana County. The results are shown in table 1.

Table 1: Descriptive statistics; Conflict resolution strategy

	Frequency and percentages (%)						
Statement	**5**	**4**	**3**	**2**	**1**	**mean**	**Std.dev**
Peace building groups/committees encourage implementation of sustainable food security initiatives	4(4.9)	40(48.8)	6(7.3)	23(28.0)	9(11.0)	3.37	0.788
Arbitrations by elders/politicians in ending conflicts influence implementation of sustainable food security initiatives	8(9.8)	47(57.3)	5(6.1)	17(20.7)	5(6.1)	3.59	0.912
There are community meetings/'Barazas' to end conflicts and promote sustainable food security in the community	9(11.0)	45(54.9)	7(8.5)	15(18.3)	6(7.3)	3.45	0.934
There are peace caravans in conflict torn areas to end conflicts and promote sustainable food security	5(6.1)	39(47.6)	11(13.4)	21(25.6)	6(7.3)	3.38	0.916
Disarmament efforts really promote peace and encourage implementation of sustainable food security initiatives	7(8.5)	43(52.5)	5(6.1)	22(26.8)	5(6.1)	3.57	0.841
Generally conflict resolution is a viable strategy to promote sustainable food security in the local community	10(12.2)	51(62.1)	3(3.7)	10(12.2)	8(9.8)	3.69	0.856
Valid listwise 82							
Grand mean = 3.508							

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From table 1, most respondents agreed (48.8%) and strongly agreed (4.9%) that peace building groups and committees encourage implementation of sustainable food security initiatives. This was because peace building is necessary requirement for residents to settle down for serious farming. Secondly, 57.3% and 9.8% of respondents agreed and strongly agreed respectively that arbitration by elders and politicians in ending conflicts influence implementation of sustainable food security initiatives. That is, it could be assumed that sometimes, conflicts are politically instigated, thus politician and community elders have to come in to find an amicable and lasting solution so as to allow farming activities to go on.

Further, most respondents agreed (54.9%) and strongly agreed (11.0%) that there were community meetings or 'Barazas' to end conflicts and promote sustainable food security in the community. This implies that local community elders sometimes come up with community meetings to come up with homegrown solutions to conflicts so as to end food insecurity in the local areas. A good percentage of respondents also agreed (47.6%) and strongly agreed (6.1%) that there are peace caravans in conflict torn areas to end conflicts and promote sustainable food security. Thus, peace caravan is conflict resolution strategy meant to portray presence of peace and harmonious co-existence between communities in dispute so as to make farming activities to go on.

More so, 52.5% and 8.5% of respondents agreed and strongly agreed respectively that disarmament efforts really promote peace and encourage implementation of sustainable food security initiatives. This implies that armed banditry activities cause panic and fear for any sustainable farming activities to take place.

On overall, most respondents agreed (62.1%) and strongly agreed (12.2%) that generally conflict resolution is a viable strategy to promote sustainable food security in the local community. The grand mean of responses is 3.508 rounded off to 4 which is agree on Likert scale of measurement, implying that most respondents supported the use conflict resolution strategy as a viable way of promoting sustainable food security in the local community. This is supported by Mkutu (2013) observed that conflicts definitely have a negative bearing on both human food and livestock pasture, since residents cannot settle down to do farming and also provide a hostile environment for investors in sustainable food security.

Agricultural production strategy and sustainable food security

This assessed the influence of the County government's agricultural production strategy on sustainability of food security in Turkana County. The results were shown in table 2.

Table 2: Descriptive statistics; Agricultural production initiatives

	Frequency and percentages (%)						
Statement	**5**	**4**	**3**	**2**	**1**	**mean**	**Std.dev**
Diversified agricultural activities promote sustainable food security in the local community	5(6.1)	43(52.4)	6(7.3)	21(25.7)	7(8.5)	3.32	0.855
The county's plan to build honey, fish &Agro processing plants can help promote sustainable food security in the local community	6(7.3)	45(54.9)	7(8.5)	16(19.5)	8(9.8)	3.36	0.862
The county's set up & expansion of irrigation schemes can help promote sustainable food security in the local	9(11.0)	49(59.7)	4(4.9)	13(15.9)	7(8.5)	3.54	0.747

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community							
Use of indigenous &drought resistant food crop farming can help alleviate food insecurity in the local community	5(6.1)	42(51.2)	9(11.0)	20(24.4)	6(7.3)	3.35	0.917
The county's plan on ward zoning of farm investments can help promote sustainable food security in the local community	7(8.5)	45(54.9)	6(7.3)	19(23.2)	5(6.1)	3.37	0.867
Generally feasible agricultural production initiatives can promote sustainable food security in the local community	12(14.6)	55(67.0)	3(3.7)	8(9.8)	4(4.9)	3.77	0.985
Valid listwise 82							
Grand mean = 3.451							

From table 2, most respondents agreed (52.4%) and strongly agreed (6.1%) that diversified agricultural activities promote sustainable food security in the local community. This is supported by the Turkana County government investment plan that encourages diversified agricultural activities and this reinforced by 54.9% of respondents who agreed that county's plan on ward zoning of farm investments can help promote sustainable food security in the local community.

More so, 54.9% and 7.3% of respondents agreed and strongly agreed respectively that the County's plan to build honey, fish and Agro processing plants can help promote sustainable food security in the local community. That is, to assist solve perennial hunger problems due to drought, the county government has crafted agricultural production strategy that aims to build honey, fish and Agro processing plants that can help promote sustainable food security in the local community; which is also supported by 59.7% of respondents who agreed that county's expansion of irrigation schemes can help promote sustainable food security in the local community. Most respondents (51.2%) also agreed that use of indigenous and drought resistant food crop farming initiatives can help alleviate food insecurity in the local community.

On overall, most respondents agreed (67.0%) and strongly agreed (14.6%) that generally feasible agricultural production initiatives can promote sustainable food security in the local community. This is supported by Yanda (2007) assertion that, flood-dependent agriculture is a gamble, as crops are washed away whenever floods are excessive, whereas inadequate floods produce insufficient harvests; and in spite of its important supplementary role, traditional agriculture does not provide enough surpluses to feed people during the periodic droughts, thus the need for irrigation schemes to foster sustainability of food security.

Relief food distribution strategy and sustainable food security

This assessed the influence of the County government's food distribution strategy on sustainability of food security in Turkana County. The results are shown in table 3.

Table 3: Descriptive statistics; Relief food distribution strategy

	Frequency and percentages (%)						
Statement	**5**	**4**	**3**	**2**	**1**	**mean**	**Std.dev**
1.The quantity & quality of relief food distributed helps alleviate food insecurity in the local community	2(2.4)	31(37.8)	10(12.2)	30(36.6)	9(11.0)	2.84	0.727
2.The nutritional value of relief food	3(3.7)	32(39.0)	9(11.0)	31(37.8)	7(8.5)	2.91	0.724

helps promote sustainable food security in the local community							
3.The no.of of beneficiaries of relief food is adequate enough to alleviate sustainable food insecurity in the community	3(3.7)	23(28.0)	6(7.3)	41(50.0)	9(11.0)	2.63	0.717
4.There is consistency of distributed relief food to help promote sustainable food security in the local community	4(4.9)	25(30.5)	7(8.5)	38(46.3)	8(9.8)	2.74	0.742
5.There is timely distribution of relief food to help promote sustainable food security in the local community	5(6.1)	27(32.9)	6(7.3)	36(43.9)	8(9.8)	2.82	0.777
6.Generally relief food distribution initiatives promote sustainable food security in the local community	4(4.9)	23(28.0)	5(6.1)	39(47.6)	11(13.4)	2.63	0.771
Valid listwise 82							
Grand mean = 2.762							

From table 3, there were mixed reactions on relief food distribution, because while 37.8% agreed, 36.6% disagreed that the quantity and quality of relief food distributed helps alleviate food insecurity in the local community, indicating relief food distribution may not be a viable strategy to ensure sustainable food security in Turkana County. This was supported by 37.8% of respondents who disagreed that the nutritional value of relief food helps promote sustainable food security in the local community; and a further 50.0% of respondents disagreed that the number of beneficiaries of relief food is adequate enough to alleviate sustainable food insecurity in the community. This implies that relief is low in nutritional value and only benefits few community members.

More so, most respondents disagreed (46.3%) and strongly disagreed (9.8%) that there is consistency of distributed relief food to help promote sustainable food security in the local community. This was further supported by 43.9% of respondents who disagreed that there is timely distribution of relief food to help promote sustainable food security in the local community. This implies that there inconsistency and untimely distribution of relief food which definitely cannot be offer a sustainable solution for food security in Turkana County.

On overall most respondents disagreed that (47.6%) that generally relief food distribution initiatives promote sustainable food security in the local community. This was supported by Transparency International (2014) assertion that as far as food distribution is concerned, there has been evidence of the politicization of food assistance, with political leaders, local elites and local relief committees influencing who received assistance. There were risks and pressures in recruitment either due to internal pressures to employ staff from certain communities, or due to political interference in food distribution. Most complaints from beneficiaries were related to targeting and inconsistency in the timing of food distributions. There were also risks and challenges regarding transportation partly due to political influence in the trucking companies, and due to transportation costs not being adequately resourced by the Government, which increased the likelihood of food rations being looted and sold or both as a form of payment; thus cannot be a viable strategy to foster sustainable food security in hunger stricken areas.

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Community coping strategies and sustainable food security

This assessed the influence of the community coping strategy on sustainability of food security in Turkana County. The results are shown in table 4.

Table 4: Descriptive statistics; Community coping strategy (CP)

	Frequency and percentages (%)						
Statement	**5**	**4**	**3**	**2**	**1**	**mean**	**Std.dev**
Migration of people/herds in search of food, grass & water help alleviate food insecurity in the community	8(9.8)	33(40.2)	9(11.0)	27(32.9)	5(6.1)	3.15	0.867
Food/fodder storage/grazing reserves help promote sustainable food security in the local community	9(11.0)	43(52.4)	5(6.1)	16(19.5)	9(11.0)	3.33	0.628
Diversification of farming activities help promote sustainable food security in the local community	10(12.2)	44(53.7)	6(7.3)	17(20.7)	5(6.1)	3.45	0.735
Consumption of wild fruits/ bush products help alleviate food insecurity in the community	3(3.7)	30(36.6)	7(8.5)	37(45.1)	5(6.1)	2.87	.0797
Commercialization of relief food help alleviate food insecurity in the local community	3(3.7)	22(26.8)	6(7.3)	40(48.8)	11(13.4)	2.59	0.733
Generally community coping initiatives help promote sustainable food security in the local community	4(4.9)	33(40.2)	5(6.1)	34(41.5)	6(7.3)	2.94	0.648
Valid listwise 82							
Grand mean = 3.055							

From table 4, most respondents agreed (40.2%) while 32.9% disagreed that migration of people and herds in search of food, grass and water help alleviate food insecurity in the community; but 52.4% of respondents agreed that food, fodder storage and grazing reserves help promote sustainable food security in the local community. This implies though migrations in search of food and water cannot really alleviate food insecurity, food/ fodder storage and grazing reserves help promote sustainable food security in the local community.

Most respondents agreed (53.7%) and strongly agreed (12.2%) that diversification of farming activities help promote sustainable food security in the local community. This is in line with the county government's food diversification strategy to help in sustainable food security in Turkana County. However, most respondents disagreed (45.1%) that consumption of wild fruits/ bush products help alleviate food insecurity in the community. Further, most respondents also disagreed (48.8%) and strongly disagreed (13.4%) that commercialization of relief food help alleviate food insecurity in the local community.

On overall, there were mixed responses about community coping initiatives because while 40.2% agreed, 41.5% disagreed that generally community coping initiatives help promote sustainable food security in the local community. This was supported

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by Botchway (2001) assertion that community participation has been the hallmark of many successful development projects around the world and some scholars identified four strengths of community participation in development including: people recognize significant difficulties, informed superior decisions are made in relation to economy by local people considering their environment and circumstances, community are able to volunteer themselves for the interventions in terms of the labour, funding and material contributions and they the local people are able to be dependency hence self-sustainability.

Inferential analyses

Linearity of the study variables was tested using Pearson's product moment correlation coefficient so as to show that independent variables had significant relationships with the dependent variable which were then considered prerequisite for running regression analysis. Since the items in the questionnaire had an admissible Cronbach alpha coefficient that reliably measured the study variable, the summation scores of the items for the study variable were computed and used in correlation analysis. Therefore the correlation analysis showed that all independent variables (conflict resolution, agricultural production, relief food distribution and community coping strategies) had significant linear relationship with the dependent variable (sustainable food security).

Table 5: Correlation analysis

		Conflict Resolution	Agricultural Production Strategy	Relief Food Distribution	Community Coping	Sustainable Food Security
Conflict Resolution	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	82				
Agricultural Production Strategy	Pearson Correlation	.611**	1			
	Sig. (2-tailed)	.000				
	N	82	82			
Relief Food Distribution	Pearson Correlation	.671**	.639**	1		
	Sig. (2-tailed)	.000	.000			
	N	82	82	82		
Community Coping	Pearson Correlation	.632**	.593**	.597**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	82	82	82	82	
Sustainable Food Security	Pearson Correlation	.791**	.782**	-.759**	.747**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	82	82	82	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

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Multicollinearity was checked using correlations between all pairs of independent variables (conflict resolution, agricultural production, relief food distribution and community coping strategies). Most researchers asserts that if correlation coefficient, (r) is close to 1 or -1, then there is multicollinearity but if correlation coefficient (r) is not above 0.9, then there is no multicollinearity (Hair et al.,2011). In this study, the highest correlation coefficient between all pairs of independent variables (conflict resolution, agricultural production, relieffood distribution and community coping strategies) was 0.791, which was below the correlation coefficient threshold of 0.9, thus multicollinearity assumption was checked and not violated.

Table 6: Multiple regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.852[a]	.725	.711	.58190	.725	50.785	4	77	.000

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.785	4	17.196	50.785	.000[a]
	Residual	26.073	77	.339		
	Total	94.858	81			

a. Predictors: (Constant), Community Coping, Agricultural Production Strategy, Relief Food Distribution, Conflict Resolution

b. Dependent Variable: Sustainable Food Security

The table 6 showed the multiple regression results of the combined effects of the four independent variables (conflict resolution, agricultural production, relief food distribution and community coping strategies). The results showed that the F-statistics produced is significant (F=50.785, *significant* at *p<.001*), thus confirming the fitness of the study model. For an R^2 of 0.725, this indicated that the conceptualized study model explains 72.5% of the variations in the sustainability of food security in Turkana County, while other factors not in this conceptualized study model accounts for 27.5%, thus, it is a good model.

Further, from the values of unstandardized regression coefficients with standard errors in parenthesis, all the independent variables (conflict resolution; β = 0.458(0.103) at $p<0.01$; agricultural production; β = 0.531 (0.116) at $p<0.01$; relief food distribution; β = -0.456 (0.103) at $p<0.01$, community coping strategy; β = 0.302 (0.127) at $p<0.05$; were significant predictors of the sustainability of food security in Turkana County (dependent variable). Therefore, the multiple regression equation for overall significant influence of the study's independent variables (conflict resolution, agricultural production, relief food distribution and community coping strategies) on the sustainability of food security in Turkana County (dependent variable) was;

(v) $y= 0.524+0.458X_1+0.531X_2 - 0.456X_3 + 0.302X_4$

Where;

y= sustainability of food security in Turkana County

X_1= Conflict resolution strategies

X_2= agricultural production strategies

X_3= relief food distribution strategies

X_4= community coping strategies

Table 7: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.524	.105		5.002	.000
	Conflict Resolution	.458	.103	.439	4.431	.000
	Agricultural Production Strategy	.531	.116	.551	4.561	.000
	Relief Food Distribution	-.456	.103	-.437	4.414	.000
	Community Coping	.302	.127	.287	2.375	.020

a. Dependent Variable: Sustainable Food Security

Hypothesis Testing

Research **Hypothesis one** stated that conflict resolution strategy does not significantly influence sustainability of food security in Turkana County. The study results indicated that there exists a positive and significant effect of conflict resolution strategy on sustainability of food security in Turkana County (β = 0.458 (0.103), at *p<0.01*. **Hypothesis one was thus rejected**. The results implied that a single improvement in peaceful conflict resolution strategies by the county government and community leaders will yield 0.458 unit improvement in the sustainability of food security in Turkana County. The results were supported by Mkutu (2013) who observed that there are many factors contributing to the risk of violent conflicts involving pastoralists which include; a challenge with land use as a result of most agricultural land being sub-divided into very uneconomical units which cannot adequately support households; dry rivers, hence no water for pastoralists who have to compete for the dwindling water resources; nomadic pastoralism; cattle rustling and banditry. These conflicts definitely have a negative bearing on both human food and livestock pasture, since residents cannot settle down to do farming and also provide a hostile environment for investors in sustainable food security.

Research **Hypothesis two** stated that agricultural production strategy does not significantly influence sustainability of food security in Turkana County. The study results indicated that there exists a positive and significant effect of agricultural production strategies on sustainability of food security in Turkana County (β = 0.531 (0.116), at *p<0.01*. **Hypothesis two was thus rejected**. The results implied that a single increase in viable agricultural production strategies by the county government and community members will yield 0.531 unit improvement in the sustainability of food security in Turkana County. The results were supported by Vijendra, (2005) assertion that the very density of Kenya's arid and semiarid lands is low and the variation in forage quantity and quality is enormous which requires intensive farming activities to restore it. These variations and periodic lack of water for livestock due to low rainfall force pastoral communities (Maasai, Samburu, Turkana, and many others) to wander continuously with their herds of livestock. Due to drought, density as well as quality of pasture deteriorates and so do the physical conditions of the livestock that feed on the pasture many livestock get weaker and eventually die of starvation, thus the need for intensive forage production initiatives.

Research **Hypothesis three** stated that relief food distribution strategy does not significantly influence sustainability of food security in Turkana County. The study results indicated that there exists a negative but significant effect of relief food distribution strategies on sustainability of food security in Turkana County (β = -0.456 (0.103), at *p<0.01*. **Hypothesis three was thus rejected**. The

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results implied that a single increase in relief food distribution initiatives by the county government and willing donors will yield 0.456 unit decline in the sustainability of food security in Turkana County. This means increase in relief food distribution is assumed to create a perceived food dependency syndrome by beneficiaries, thus does not encourage community members to engage in sustainable food security activities. The results were supported by Save the Children (2014), report that there have been failures to respond to early warning, which ultimately led to a late, rushed and politically pressurized response in Kenya. This meant that some organizations struggled to put strong procedures in place in the time available, heightening the risks of corruption and diversion. It also meant that there were greater challenges to scaling up and ensuring the availability of adequate resources to manage and monitor the quality and effectiveness of the response. Echoing previous years, there were also questions regarding why the ASALs have not seen greater investments in risk-reduction measures to reduce the need for more costly emergency responses (Save the Children, 2014).

Lastly, research **Hypothesis four** stated that community coping strategy does not significantly influence sustainability of food security in Turkana County. The study results indicated that there exists a positive and significant effect of community coping strategies on sustainability of food security in Turkana County (β = 0.302 (0.127), at $p<0.05$. **Hypothesis four was thus rejected**. The results implied that a single increase in viable community coping strategies by the county government and community members will yield 0.302 unit improvement in the sustainability of food security in Turkana County. The results were supported by Zhang and Faerman, (2007) who reported that in successful community projects in implementation and sustainability, local leaders must have the project management knowledge, skills and practical approach and must be experienced in project management. Thus, the style of community leadership and the level of creativity in handling project issues can also determine if the project is sustainable. Therefore, local community leadership will affect project culture, their strategies and the team commitment and that without appropriate community leadership in any initiative, the risk of the project failure also increases.

CONCLUSIONS

The study concluded that peaceful conflict resolution in Turkana County is a mandatory strategy to enable community members peacefully settle down and engage in farming activities that can foster sustainable food security in Turkana County. The county agricultural production strategy as envisaged in the current County investment strategic plan can enhance sustainable food security in Turkana County if achievably implemented. Relief food distribution strategy is a short term measure to solve food security and cannot be used to sustain food security in Turkana County as it tends to create relief food dependency syndrome among community members. Community coping strategies can be used to foster sustainable food security but with the support of the County government.

RECOMMENDATIONS

Turkana county government in liason with the local community leaders should craft feasible conflict resolution strategies that can promote peaceful co-existence among all communities and attract investors in agribusiness activities. Turkana county government should practically implement the agricultural production strategy as envisaged in the Turkana County Investment Plan (2016-2020); so as foster sustainable food security in the county. The county government in liason with willing food distribution organizations should discourage communities' high dependence on relief food distribution as this only offers short term solution and cannot foster sustainable food security in the county. The Turkana county government in liason with resourceful community members should encourage community coping strategies like coming up with strategic food and fodder reserves to cater

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for human food and livestock feeds during dry seasons.

Areas for further research

A similar study can be done in Baringo County and other arid and semi-arid areas so as to compare results. A longitudinal study (for a span of 5 years) can be done in arid and semi-arid areas to assess the success indicators of the agricultural production strategies like zoning in diversified farming, irrigation schemes and value addition to food and fruit products, plus both small & scale agro-processing plants.

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