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Livelihood and Food Security Situation among In-migrant and Non-Migrant Communities in Kajiado County, Kenya

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Abstract:
Non-existent micro-level estimates on the impact of migration on livelihood in rural areas in Kenya, compounded with minimal literature on the same, called for this study. This study used secondary data from the 2005 to 2015 African Wildlife Foundation Livelihoods dataset from Kilimanjaro landscape, with the purpose was of undertaking a comparative livelihood analysis between the in-migrant and non-migrant communities in Kimana Community of Kajiado County in Kenya. The study shows that in-migrants engage in a variety of livelihood strategies unlike non-migrants who undertake mainly livestock rearing. Livelihood endowment is associated with diversification of strategies, and was established to be responsive to: nutritional status of children from either of the communities; amount of land under cultivation; level of education, and; stability of market based on household economic status. Lower food security due elderly headed households and spouses with low level of education was observed among the non-migrant communities. Equally, children of in-migrants had a higher stunting rate (6.06 percent) compared to those of non-migrants (5.12 percent), just as the anthropometric assessment showed that children of the non-migrant communities than those of the in-migrants had higher nutritional levels. Household livelihood assets like natural resources, education of household spouses, tradition and culture of the people, was established to be significant factors affecting food and nutrition security.
It implies that food security (i.e. availability, stability and dietary diversity) is better among the in-migrant households than the non-migrant households, while anthropometry assessments show that non-migrants have higher nutritional capacity than their in-migrant counterparts; implying that food availability does not necessarily ensure food security. Education of female spouse rather than male household head positively influences the food availability and stability in the household. Hence, the need for policies that are responsive to female education, natural resource exploitation and micro-level population policies.

Keywords: *in-migrants/non-migrants, livelihood strategies, food availability/security, anthropometric assessment, micro-level data, dietary diversity, nutritional status*

1. Background

Migration to either familiar or unfamiliar territories in search of arable land and water to support agriculture is an adaptation strategy adopted by some communities in order to circumvent the impacts of climate change and variability that have ravaged many communities in Africa. The existent hardships are both in terms of limited water and grazing land availability; putting greater challenges to their livelihoods. Such mobility forces the migrants to adopt new livelihood strategies of taking to arable farming, due to the available vast quantities of land among the pastoralists (Ackah and Medvedev, 2010). Kimana is located in Kajiado County and is purposively selected as a case study because of the presence of a fast increasing settlement of in-migrant farmers in the area that is predominantly inhabited by a non-migrant pastoralist community. This study defined migrant farmers as those people who have stayed in Kimama since 2009 practicing crop farming whether on leased, donated or purchased land although Kimana has been historically dominated by the Maasai pastoralists whose main livelihood production is livestock. The pastoralists have used their land predominantly for keeping cattle and nothing else until recently when in-migrant farmers moved in, and the lands adversely fragmented for agricultural use. Even though Kajiado County is predominantly arid and semi-arid land (ASAL), Kimana rests on a wetland; hence making it attractive to both crop farming and pastoralists due to all year round presence of water. The presence of a

wetland, with water available for irrigable agriculture has provided a favourable environment for influx of small scale farmers, necessitating competition for pasture and water in the area.

With a population of 19,644 people in Kimana, and a total fertility rate of 3.1 percent annum (KDHS, 2014), it is a sign that if this goes on uncontrolled would lead to population explosion in the area. For instance, Kajiado County has a young population of 42 percent of the population that is aged between 0-14. Recent in-migrants include people from other ethnic communities majorly Kikuyu, Kamba, and the Sukuma from Tanzania who came in primarily in search of pasture for their few cattle as a disguise. The secondary reasons for in-migration include: good land for crops, moving away from diseases, land shortages and conflicts in their places of origin (Antezza, 2008). According to Bovin(1990), the in-migrants who are mainly agro-pastoralists, use available natural resources more intensively than the indigenous Maasai. The greatest part of Kimana is of alluvial flood plains situated at an elevation of slightly less than 300m above sea level. The area has about 336,340 hectares of land potential for irrigation, among 434,390 hectares which are potential for irrigation in Loitoktok region. The traditional staple food is rice but now maize has been adapted to. Acquisition of land by the in-migrants is by opening unused lands leased by the Maasai to in-migrants (which is normally barren), who practice agro-pastoralism.

While migration can represent a livelihood and adaptation strategy in response to a wide variety of events and structural shifts (Awumbila et al. 2014), the actual welfare impacts of this phenomenon has been a source of debate in the literature.About three decades ago, the negative effects of migration dominated the literature. It was argued that migration often negatively affects socio-economic development of sending areas, as a result of shortage of labour, declining productivity and brain drain. Migrant receiving areas were also assumed to record many problems, including pressure on social amenities, emergence of slums, increased unemployment, and declining standards of living (Owusu et al., 2008). However, there is increasing evidence to suggest that migration can be a reaction to severe poverty, or a chosen livelihood strategy to improve upon household wealth (Kothari, 2002; Lipton, 1980). According to de Haas (2008), migration acts as a catalyst in the transformation process of not only the destiny of individual migrants but also the conditions of family members left behind, local communities and the wider sending regions thereby improving their welfare.

The following research questions guide this study: What are the livelihood strategies pursued by the in-migrants and non-migrants in Kimana? How different are the in-migrants and non-migrants in terms of livelihood asset endowment? What are the differences (and/or similarities) between migrant and non-migrant communities in the Kimana in terms of food security outcome? Despite its potential for improving livelihoods of poor people, as well as the positive changes in both sending and receiving areas, the relationship between migration and the well-being of migrants' households has, historically, received little attention in both academic and policy circles (Awumbila et al., 2014; Cuong et al, 2009). The way a household copes with and withstands economic shocks depends on the options available in terms of capabilities, assets and activities that are part of the household livelihood strategy (Black et al., 2006; Bellu, 2005). This is important both from a positive and normative viewpoint. In fact, households belonging to different socio-economic groups have different strategies to earn their own living which, in turn, may ensure different levels of resilience to food insecurity. As a result, households belonging to different socio-economic groups (for example, a farmer's household verses pastoralists) require different interventions. The study area is characterized by a situation in which livelihoods are increasingly threatened as areas for cultivation are shrinking, which leads to decreasing per capita income, soil fertility and hence productivity. As it is nearly impossible to intensify agricultural production in the county, there is an urgent need to resort to activities outside the agricultural sector within this area, including migration.

While economists have typically studied rural-to-urban migration in developing countries and the role of economic opportunities in the urban areas, it has not been the case about migrants pursuing livelihoods opportunities in the rural areas where the conditions restrict migrants to imperfect markets, land shortages, rising population, the insecurities of agricultural production and unstable livelihoods (Ratha et al., 2011). A number of studies on the livelihoods of migrants have revealed typical push or pull factors. Several studies have further pointed at a strong selectivity of migration, especially regarding physical and human capital characteristics, such as asset endowment and education (Teye and Yebleh, 2014). In Kimana, the existence of the two resource competing livelihood systems creates pressure on the ecology, leading to depletion of its natural resource base and hence reduced livelihoods productivity source. The outcome of this situation is that the well-being of non-migrants who own weak assets is affected first before that of the in-migrant community. This predisposes the non-migrant to livelihood shocks, risks and fragility leading to failure in attaining livelihood outcomes. Against this background, it was necessary for this study to analyze evidence from a typical case of a fast populating rural area in Kimana, Kajiado County in Kenya. The study sheds light on the empirical situation of the underlying factors of substantial ongoing migration flows into Kimana. Therefore, this study helps to identify how the livelihood strategies of one community impact itself and that of the other community in terms of food security. This is why the study compares food and nutrition security of households between the in-migrants and the non-migrants in the study area. The study also capitalizes on the comparison of entitlements to social services or public assets between the in-migrants and the non-migrants, thereby informing achievements made towards attaining targets of Kenya Vision 2030 in Kajiado County as regards to food and nutrition security.

1.1. Past Studies on Migration-Livelihood Nexus

There is increasing evidence that migration can contribute significantly to the reduction of poverty, social inequality, social exclusion, accumulation of household wealth and contribute to overall economic growth and development in both sending and receiving areas (Yaro et al., 2011; Murrugarra et al. 2011). There is however, inadequate research on the impact of migration on the rural places of destination of migrants. However, where such empirical data exist, it is often a negative portrayal of the effect of migration on

development issues. The Darfur conflict which was a result of encroachment of cultivated land by migrant pastoralist is more pronounced. The conflict escalated into war which led to the deaths of approximately 300,000 people (Adepoju et al, 2005; Adepoju, 1993). However, conflicts are usually a result of failure of coexistence, despite a range of potential opportunities that may arise from coexistence of two different groups. Among the pastoralists and agrarian communities, a wide range of cooperative and synergistic relationships may exist (Adepoju et al, 2005). Exchange of skills, goods and services arising from such co-existence is crucial to the growth of rural economies. Where positive relationship exists, exchange between the agrarian and pastoralist communities have been instrumental not only in satisfying the growing need for food security but also income for both populations. From the perspectives of migrants and their host communities, migration has a function of reducing vulnerability. Effective migration strategies help people to reduce the risks of seasonality, harvest failure, and any form of livelihoods shocks.

In Kenya, the relationship between migrant farmers and pastoralists is one of uncertainty (Owuor, 2006; Odipo, 2000). There are cases of communal warfare for example in parts of rift valley where killings of people took place in 2008 and later peaceful coexistence (Andrews, Clark, and Whittaker, 2008; Anarfi, 2000; Odipo, 2000). Cattle raids are more experienced after droughts both for ecological and economic reasons because households hit by the drought are desperate to restock herd. The rainy season makes it further convenient to raid, as the livestock have a better chance of survival (Owuor, 2006). In certain instances, migration has residually contributed to the dual polarization of land holding and the recovery of land (Mutie, 2012). Migration impacts depend on such contexts as seasonality of movement, educational levels of migrants, the length of time spent away, assets, and social structures and institutions allowing migrants to pursue activities previously reserved for men and household heads.

The study area is primarily habited by the Maasai who are historically pastoralists with land being communally owned, while the in-migrating communities are generally farmers from other parts of Kenya and from Tanzania. The lifestyle of the Maasai community has undergone transformations due to ongoing land adjudication and sub-division of group ranches leading to private land tenure system. This has increased the rate of land sales and created openings to in-migrations especially in the relatively high agricultural potential areas such as Kimana, Entonet, and Kuku divisions. The coexistence of the two major livelihood systems in Kimana creates pressure to the rangeland ecology, causing vulnerability and reduced productivity. This affects households inversely depending on the level of resilience or vulnerability (Mbonile and Mwamfupe, 2014). However, it is worth noting that resilience is the function of livelihood capital asset endowment and the position of the household in the socio-political fabrics of a society. In Kimana, a pastoralist livestock system using streams and swamps for dry season fodder and water is subject to competition from stream diversion for irrigated vegetable production and reservation of the wetland for commercial wildlife tourism and higher rainfall upland areas for maize and beans farming.

Studies on how migrants fare over time does indicate that they often are able to improve their position, if initially they are slightly worse-off but they make up for the differences rather quickly (Awumbila et al. 2014). This may not be true in rural settings because the environmental and cultural factors may be different. It is known that livelihoods and poverty clearly affect and are affected by migration, but that there are no easy generalizations because research on sustainable livelihoods and the complexity of migration processes may be dependent on local contexts. Some studies also indicate that there is very little about the linkage between migration and other households' livelihood strategies, particularly intensification and diversification among migrants and non-migrants. Given the different views on relationships between migration and livelihood strategies, this study focused on livelihood analyses of in-migrant and non-migrant communities in Kimana area of Kajiado County, comparing livelihood strategies of each group and their related food-security outcomes.

2. Methodology

Study Design: Administratively, the Kimana is divided into 5 wards in Kajiado South Constituency. Purposive sampling was used to obtain 4 representative wards from which estimates were generated because of the degree of interaction between the in-migrants and non-migrants due to their proximity in their settlements. A total of 368 households (cases) were sampled from the main database with 150 as in-migrant, 200 as non-migrant households, and 18 households that practiced small scale trade only. Data were disaggregated by migrant and non-migrant households. The in-migrant population in the sample is smaller than that of non-migrant because of the application of the probability proportional to size (PPS) factor. Table 1 shows the distribution of sampled households, which is 28.8 percent of the total number of 1,233 households in the database; which is in line with the recommended minimum sample for a social study (i.e. 5 percent to 8 percent of the population), while a sample of 30 respondents is the minimum number of cases for studies in which statistical data analysis can be done. However, Table 2 shows the number of children sampled for anthropometric measures.

Ward	Total Households	Sampled Households		
		In-Migrants	Non-Migrants	Total
Entonet/ Lankisim	516	53	63	116
Mbirikani/ Eselen	301	41	57	98
Keikuku	282	32	47	79
Rombo	134	24	33	57
Total	**1,233**	**150**	**200**	**350**

Table 1: Number of Sampled households in each ward
Source: computed by author

Ward	Sampled Households		Total
	In-Migrant	Non-Migrants	
Entonet/ Lankisim	9	5	14
Mbirikani/ Eselen	3	12	15
Keikuku	15	7	22
Rombo	12	9	21
Total	**39**	**33**	**72**

Table 2: Number of children measured for anthropometry
Source: computed by author

2.1. Data Collection and Analysis

Data were analysed to establish the levels and distribution of in-migrants and non-migrants and the effect of migration to their livelihoods after application of livelihoods strategies based on the livelihoods assets they have at their disposal. This permitted establishing the differences in livelihoods assets within the households. The study used quantitative, secondary data drawn from the 2009-2015 African Wildlife Foundation (AWF) livelihoods database with respect to migration, livelihood strategies and food security in the sampled households. Anthropometric measurements for children of age of six to fifty-nine months were used, with focus on mid-upper arm circumference (MUAC), height and weight. The measurements for the children were important as they are the most vulnerable to food insecurity. Hence, their nutrition status was a good indicator of food and nutrition situation in a community.

The household was the unit of analysis, and in-migrants who had moved into the study area since the year 2005 were included in the analysis (i.e. both bivariate and linear regression analyses). Bivariate analysis was used to identify the nature, type, direction and strength of the relationship between the independent and dependent variables, and also to determine if the relationship between the independent and dependent variables were statistically significant. Household wealth was a determining factor of the value of in-migrant and non-migrants' livelihood. Patterns of farmland holding with the main crops produced and livestock ownership was also assessed. The following analyses were undertaken to examine livelihoods distribution portfolios: (i) frequency distribution of asset endowment among households of migrant and non-migrant households (ii) Establishing the likelihood of a household to diversify the livelihoods asset as a result of co-existence.

The measurements of indicators of nutritional status of children were calculated using the NCHS – 2013 integrated growth reference incorporated in the Nutri-Survey software. To compare the extent of food availability and dietary diversity among households of the migrant and non-migrant pastoralist communities, a multivariate analysis was used to predict the significance of the association between the dependent and independent variables, while controlling for one or more variables, by using the linear regression model. Therefore, the ordinary least squares were employed. The selection of the explanatory variables included in empirical models was based on social-economic factors and consumption patterns of the livelihood groups in the community. Table 3 shows the variables and their operational definitions; as the same variables were used in the regression analyses. The ordinary least square model of the general form as shown in the equation below was used.

$$\mathbf{Y = ß_0 + ß_1 X_1 + ß_2 X_2 + \ldots + ß_i X_i + \varepsilon_i}$$

Where: **Y** = Dependent variable (Table 3)

$\mathbf{ß_0}$= Constant,

$\mathbf{ß_1, ß_2, ß_i}$= Coefficients of variables,

$\mathbf{X_1, X_2, X_i}$= Independent variables (Table 3)

$\boldsymbol{\varepsilon_i}$= Error term.

Dependent Variables	Household Dietary Diversity Score
	Number of months of food availability in the household
Independent Variables	Household's total area cultivated in acres
	Level of education of household spouse (quantified by number of years of schooling)
	Agricultural labour as a dummy variable of source of income in the household (coded: 1 = agricultural labour, 0 = not agricultural labour)
	Work force (number of working persons in the household)
	Chronological age of household head in years
	Household dependence ratio (percentage ratio of number of dependants to total household members)
	Migration as a dummy variable of household livelihood (coded: 1 = In-Migrants, 2 = Non-Migrants)
	Fishing activity as a dummy variable of household source of income (coded: 1 = fishing, 0 = not fishing)
	Level of education of household head (quantified by number of years of schooling)

Table 3: Explanatory variables included in Ordinary Least Square Regression Model
Source: African Wildlife Foundation Livelihood database for Kilimanjaro landscape (2005-2015)

3. Study Findings

3.1. Household Food Security and Dietary Diversity

Food security was partly measured using two variables household dietary diversity score (HDDS), and the number of months the household still had some own produced food in store. The findings for the two variables show that the mean food-secure months for non-migrant's households is 8.21 whereas for in-migrant households is 9.92, of the 12 months (Table 4). Overall, the proportion of households with food secure months above the median of nine months is only 45.2 per cent. Comparison of these means, using independent t-test, shows the difference in food security in terms of number of months of food security between the two livelihood groups to be statistically significant (p=0.01). This means, on average the non-migrants' livelihood provides 82.67 per cent annual security to food, compared with in-migrant livelihood which provides only 68.42 per cent. On the other hand, the household dietary diversity score (HDDS) shows that the mean for in-migrant households is 6.839 in the scale of 12 food groups (scores), whereas for non-migrants is 5.2 (Table 4). Overall, the proportion of households with HDDS above the median of six is only 26 per cent. The means difference for the two livelihood groups is statistically significant (p=0.001).

	Number of months of food availability (MONTFAVL)		**Household dietary diversity score (HDDS)**	
	n	**Mean**	**n**	**Mean**
In-Migrants	55	9.919	55	6.839
Non-Migrants	31	8.209	31	5.2
p-Value		0.01		0.001

Table 4: Number of months of food availability and Household dietary diversity score (HDDS) means comparison, independent t- test
Source: computed by author

3.2. Nutritional status of children in Kimana

The indicators used for nutrition status of children are height-for-age z-score (HAZ) which reflects chronic malnutrition (i.e. stunting); weight-for-age z-score (WAZ) which reflects both chronic and acute under-nutrition (i.e. under-weight); and weight-for-height z-score (WHZ) which reflects short term food insecurity effects such as seasonal changes in food supply or short term nutritional stress brought about by shock e.g. illness (wasting). Mid-upper arm circumference (MUAC) reflects under-weight or malnutrition in general. On average about 15.3 percent of the households (children) were underweight (low weight-for-age), 47.2 per cent were stunted (low height-for-age), 5.5 percent wasted (low-weight-for height) and 2.7 per cent of children in the study area were obese. The severe acute malnutrition (SAM) (MUAC<11.5cm) is 1.38 percent whereas the global acute malnutrition (GAM) (i.e. MUAC<12.5cm) is 16.3 percent. It means that the non-migrant community has high proportion of chronically malnourished children (both stunted and under-weight) than the in-migrant (Table 5).

	Study Results			**Kajiado County (%)***	**National (%)***	
	In-Migrants	Non-Migrants	Overall		Overall	Rural Areas
Stunted (HAZ ≤ -2SD)	42.42	51	47.22	18.2	26.0	29
Wasted (WHZ≤-2SD)	6.06	5.12	5.55	3.0	4.0	4.0
Under-weight (WAZ ≤ -2SD)	12.12	17.95	15.28	8.1	11.0	17
MUAC						
GAM (MUAC<12.5)	3.03	7.69	5.55	-	-	-
SAM (MUAC<11.5)	0	2.56	1.38	-	-	-

Table 5: Comparison between children's nutritional status in Kimana and those at County and National levels
*Source: Computed by author; *KDHS (2014)*

It was established that the non-migrants' children were more wasted (suffer immediate hunger) than the in-migrants' children. A comparison between the rural population in Kajiado and National levels shows that stunting and underweight rates among non-migrants' children in the study area was lower than the national average, while the wasting rate among the non-migrants' children is higher than the Kajiado and National rural areas averages. Paradoxically, the in-migrants' children have higher stunting rate, yet have similar rates of wasting and underweight with the Kajiado County and National averages (Table 6). The analysis also shows that while in-migrants' households had more number of months of food availability and higher dietary diversity score than non-migrants' households, the nutritional status of their children was worse than that of the non-migrants'. This can be explained by the famous entitlement theory as documented by Sen (1981), whereby food availability does not always ensure food security, as members in the in-migrants' households, especially children and probably women are not equitably entitled to the food even though it is available, leading to the aforementioned scenario.

The results of GAM and SAM indicate a considerable deviation from the national status. This can be explained by the fact that the survey was done in between July and August, which is a period of acute food shortage in the study area. According to World Bank

(2010), the prevalence of GAM of between 5 per cent and 9 per cent indicates poor condition while GAM of less than 5 per cent is acceptable. Therefore, nutrition situation among the non-migrant households in Kimana, in this respect is poor. Stunting is also higher among the in-migrants than the national average. However, such large indication of malnutrition is not uncommon in rural settings. The t-test comparison of mean values of these nutritional outcome indices (Table 6) in the two livelihood groups show that the mean Weight-for-Age z-score, mean Weight-for-Height z-score and mean MUAC between the two groups are not statistically significant at $p \geq 0.05$ while the mean Height-for-Age z-score for no children are significantly lower than that of in-migrants' children ($p<0.05$).

	N=72	MEAN HAZ	MEAN WAZ	MEAN WHZ	MEAN MUAC	MEAN NO. OF MEALS
In-Migrants	33	-2.4609	-1.3164	0.3133	13.721	2.52
Non-Migrants	39	-1.3441	-1.0251	-0.2903	14.359	2.64
p-value		<0.001	0.226	0.079	0.082	0.32

Table 6: Anthropometric measurements (independent t-test comparison) results
Source: computed by author

3.3. Livelihood Assets Endowment

Variables used in this aspect, which were hypothesized to have direct impact on food security, are education, farm acreage, size of work force and dependency ratio. The two study communities were compared in terms of these variables using independent t-test. Table 7 shows that the in-migrants are relatively more educated with a mean year of schooling of 6.9 against 3.55 of non-migrants. The in-migrants also have a low dependency ratio of 58.57 per cent against 69.93 per cent of the non-migrants who also had a bigger household workforce of 5.42 persons per household against 2.96 of the in-migrants. The mean cultivated area is higher for the in-migrants, 12.9 acres against 4.22 acres of the non-migrants. All the variables are statistically different at 5 per cent significance level ($p<0.05$).

	N	Mean HH Size	Mean year of schooling	Mean workforce	Mean dependency Ratio (%)	Mean cultivated Area (Acre)
In-Migrants	150	5.16	6.94	1.96	58.57	4.22
Non-Migrants	200	8.42	3.55	2.42	67.67	12.9
p- Value			0.038	0.001	0.003	0.00

Table 7: Comparison of livelihood asset endowment (independent t-test)
Source: computed by author

3.4. The effect of migration on Household Dietary Diversity (HDD) Score

The household dietary diversity score (HDDS) reflects, the economic ability of a household to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with improved socio-economic status and household food security.

Table 8, just as the results on the regression analysis (Annex 1) show the differences in HDDs controlling for education of household head (quantified by number of years of schooling), source of income (dummy variable), dependency ratio, total cultivated area of household in acres, education of household spouse (number of years of schooling) and livelihood group (dummy variable).

Variable	Co-efficient	Std Error	p-Value	Collinearity Tolerance	Mean
CONSTANT	6.771	0.682	<0.001		
In-Migrants (Ref category Non-Migrants)	1.229	0.430	0.005	0.531	0.320
Level of education of household spouse	0.182	0.050	<0.001	0.669	3.290
Household's total area cultivated (Acres)	0.070	0.035	0.047	0.544	7.691
Household dependence rate	-0.033	0.009	0.001	0.916	61.920
Fishing activity	-1.754	0.763	0.024	0.929	N/A
Level of education of household head	-0.074	0.056	0.191	0.701	4.520
R	0.638				
R^2	0.408				
ADJUSTED R^2	0.368				
F-VALUE	10.322	1.440	<0.001		

Table 8: Estimated coefficients of the factors affecting household dietary diversity
Source: Author calculated the Dependent variable: Household dietary diversity score (HDDS)

The following assumptions were made between the dependent variable (food security status) and the independent variables as described above. Income generating activity determines the income level which then determines the purchasing power of the

household, such that as household income accrues outside farm work (off farm diversification), the ability of the household to access diversity of foodstuffs increases as well, leading to acquirement of variety of nutrients. Therefore, a positive relationship between source of income other than farming (e.g. petty businesses) and variety of consumption at the household was expected.

The level of education attained by household head and or spouse is expected to increase awareness among households in terms of consuming dishes with varied foods/ balanced diets. Therefore, a positive relationship between the education level of household head and/or spouse and nutrient adequacy among household members is expected. Cultivating large pieces of land enables people to grow different types of crops hence multiple choices of foodstuffs. Therefore, there is possibility of positive relationship between dietary diversity and total cultivated area of a household. Livelihood group was included to capture cultural aspects of production and consumption. A household would be more burdened if it has a large number of non-producing than producing members. A negative relationship is expected in this case between household dependency ratio and food security in terms of HDD, as shown in Table 8.

Of the six variables deemed to have influence on the dependent variable, five were found to have significant influence. These are fishing as income generating activity, dependency ratio, total cultivated area of household in acres, education level of household spouse and in-migrant livelihood ($p<0.05$) as shown in Table 8. Education of household head was not found to be significantly influencing dietary diversity. Independent variables explain 40.8 per cent of the variations in the dependent variable ($R^2=0.408$). The F-value is highly significant ($p<0.001$) at 5 per cent probability level, indicating that the regression model is statistically significant in explaining variation in the dependent variable.

3.5. Household Food Availability vis a vis Migration

The level of education attained by household head and or spouse is expected to increase awareness among households in terms of economy in consuming the harvested food so as it lasts for as long as the next harvesting period. Therefore, a positive relationship between the education of household spouse and food availability and stability at home was expected (Table 9). Cultivating large pieces of land enables people to grow different types of crops hence get large volumes of harvest which is likely to stay long in store before it is exhausted. Therefore, there is possibility of positive relationship between food availability and stability and total cultivated area of a household. Livelihood group was included to capture cultural aspects of production and food use/consumption. A household would be more burdened if it has a large number of non-producing (dependents) than producing members. A negative relationship was expected in this case between household dependence ratio and food availability and stability whereas a positive relationship was expected with the number of workforce in the household.

Variable	Co-efficient	Std Error	p-Value	Co linearity Tolerance	Mean
Constant	12.306	1.301	<0.001		
Level of education of household spouse	0.147	0.060	0.016	0.87	3.290
Household's total area cultivated in acres	0.100	0.046	0.032	0.582	7.691
Agricultural labour as a dummy variable of source of income	-0.573	0.609	0.350	0.868	N/A
Work force: Number of working persons in the household	-0.468	0.380	0.222	0.821	2.120
Chronological age of household head	-0.038	0.017	0.025	0.751	46.680
Household dependence rate	-0.014	0.014	0.316	0.78	61.920
Non-Migrant livelihoods (ref. in-migrants)	-1.359	0.512	0.009	0.608	N/A
R	0.598				
R^2	0.358				
ADJUSTED R^2	0.307				
F-VALUE	7.075	1.965	<0.001		

Table 9: Factors Affecting Food Availability and Stability in the Household
Source: computed by author

A negative relationship is expected in non-migrant's livelihood for food availability and stability because they are compelled to sell the little harvested food so as to get money to meet other necessary expenses, and therefore food will not stay long in store. Lastly, it is expected that households with older household heads have more social capital (and therefore food sources) than younger headed households. Therefore, it was expected a direct relationship between age and food availability and stability in the household. Of the seven variables deemed to have influence on the dependent variable (food availability and stability), four were found to have significant influence (Table 9). Also see annexes for detailed results. These are total cultivated area of the household in acres, education of household spouse, age of household head and non-migrant livelihood ($p<0.05$). Dependence ratio, work-force and agricultural wage labour were not found to be significantly influencing food availability and stability.

Based on the results in Table 9, the included variables explain 35.8 per cent of the variations in the dependent variable ($R^2=0.358$). The F-value is highly significant at 5 per cent probability level ($p<0.001$), indicating that the independent variables all together are statistically significant in explaining variation in the dependent variable. The education of the spouse (women) and not household head (men) had positive influence on food availability and stability in the household. This can be plausibly attributed to women in rural areas being mostly responsible for taking care of the family and therefore make sure that the available/harvested food is used

prudently to cover as many months as possible before the next harvesting season. According to the regression equation, it shows that for every unit increase in the number of years of schooling of a spouse, the number of months of food availability in store increases by 0.15 months. It was also noted that the association between age of household head and months of food availability was not significant, as the increase in the age of the household head by one year resulted in the decrease in the number of months of food availability by 0.04 months. This can plausibly be that, as the household heads gets older, they tend to accumulate more dependents in the household and therefore more mouths to feed and vice versa.

4. Conclusion and Recommendations

4.1. Conclusion

The primary aim of this study was to undertake livelihood analyses of in-migrant and non-migrant communities in Kimana, Kajiado County by comparing their livelihood strategies and the resulting food security outcomes. The study established that both migrants and non-migrants pursued a variety of livelihoods approaches such as crop cultivation, provision of labour force, livestock production, and income diversification; with the aim that every household regardless of its migratory status, it was food secure. Though so, the migrant households pursued more agro-pastoralism, whereas the non-migrant were pursued only pastoralism as their means of livelihood. This means that the non-migrants were held together with their cultural norms.

Household asset endowments for the two livelihoods groups were also broad. In-migrants were relatively more educated with a mean year of schooling of 6.9 against 3.55 of non-migrants. The in-migrants also have a low dependency ratio of 58.57 per cent against 69.93 per cent of the non-migrants who also had a bigger household workforce of 5.42 persons per household against 2.96 of the in-migrants. The mean cultivated area is higher for the in-migrants, 12.9 acres against 4.22 acres of the non-migrants. All the variables are statistically different at 5 per cent significance level ($p<0.05$).

Comparing the extent of food availability and dietary diversity, among households of the migrants and non-migrants, fishing as income generating activity, dependency ratio, total cultivated area of household in acres, education level of household spouse among in-migrant livelihood ($p<0.05$) had an influence in the household diet diversification. Similarly, among the in-migrants total cultivated area of the household in acres, education of household spouse, age of household head and non-migrant livelihood ($p<0.05$) had influence on food availability in the household. Dependence ratio, work-force and agricultural wage labour did not significantly influence food availability and stability. Overall the in-migrants grow more food but their households are on average less food secure (endowed) than the non-migrants.

The in-migration into the study area has caused several challenges to the socio-economy and environment in the area, as despite relatively low land productivity, to date more land is under arable farming (i.e. crop husbandry) due to the availability of animal draught power and the presence of a wetland in Kimana. Thus, in addition to small scale livestock keeping, the in-migrants do also leadin crop production in the study area, since they grow vegetables, maize, sweet potatoes, cassava and to a small extent, *simsim*. With the ever increases in the price of foodstuffs, the poor households can't afford stocking their requirements during shortage periods; impacting adversely on the community, particularly, children. This manifested in under nutrition of children, as portrayed in their anthropometric status, such as the number of under-five children among both the non-migrant and in-migrant communities. Paradoxically, it was established that while in-migrants are food secure, anthropometry assessments show the non-migrant to be nutritionally better. This implied that food availability does not necessarily translate into food security, as utilization due to inequitable intra-household entitlement to the food could explain the inverse relationship.

More so, livelihood asset endowment was established to be in favour of the non-migrants since their being well endowed with livestock as means of productive assets and reliable social ties, guaranteed their mutual assistance and support to one another at the times of need. However, the low or none education level attainment among majority of the household heads negatively impacts on the livelihood and food security among non-migrants, then does the in-migrants. Thus, policymakers should tailor their county and national livelihood and food security strategies in way that would enhance usage of diverse strategies, limit the number of wives and children, and encourage education to improve on knowledge of community members.

4.2. Recommendations

Despite ownership of large flocks of livestock and its contribution to the economy of the people in Kimana, the non-migrants should benefit from the local education policies that are responsive to females' education. This is based on the study findings that when the education levels of the spouses of household heads are elevated, then food security improves.

The study also showed that as the household head increases in age, household food security decreased; which could be due to polygamous marriage, which leads to an increase in the number of household members, thereby increase in dependency ratio. There is therefore need for an advocacy against many wives in Kimana (i.e. discourage polygamy and early marriage). Most so, poverty, hunger, extravagant feeding practices and dependence on natural resources which are inherent in the culture of the indigenous non-migrants have no place in the modern competitive economy aspired in the Vision 2030.

The in-migrants also have opportunity to keep livestock rather than arable farming for milk, food and draught power because they can have access to enough land. However, this can only be healthy if the local land tenure systems are friendly to in-migrants. Thus, there is need for improved land tenure systems that are reflective of the national land policy, so as to be beneficial to in-migrants to enable them pursue livelihoods opportunities that would as well uplift the local host community.

More so, transformation from hand hoe to oxen plough tillage will turn around the agricultural production of the in-migrants. In addition, keeping of livestock such as poultry, sheep and goats is a good shield against livelihood shocks for poor households. Moreover, the non-migrants should change their eating habits (i.e. eating exclusively rice) during harvesting time, but instead they should include other available foodstuffs in their menu for better nutritional status. This would also increase their resilience to shocks of drought.

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Annex 1: Regression Analysis Results

i). Dietary Diversity Score (DDS)			
Descriptive Statistics	**Mean**	**Std. Deviation**	**N**
Dietary Diversity Score of Households	5.866	1.8122	97
In-migrant dummy variable	0.32	0.469	97
Number of years of schooling of spouse	3.29	3.608	97
Cultivated area of the household land in acres	7.691	5.757	97
Percentage proportion of dependants	61.9201	16.79698	97
Fishing for income	0.04	0.2	97
Number of years of schooling of household head	4.52	3.113	97

Table 1

Model Summary				
Model	**R**	**R^2**	**Adjusted R^2**	**Std Error of the estimate**
1	0.638[a]	0.408	0.368	1.4405

a. Predictors: (Constant), number of years of schooling of household head, fishing for income, percentage proportion of dependants, cultivated area of the household in acres, number of years of schooling of spouse, agro-pastoral (in-migrant) dummy variable.

Table 2

ANOVA[b]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	128.509	6	21.418	10.322	0.000[a]
Residual	186.748	90	2.075		
Total	315.258	96			

Table 3

Co-efficients							
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Tolerance**	**VIF**
	ß	**Std. Error**	**ß**				
1 Constant	6.771	0.682		9.934	0.000		
In-Migrants dummy variable	1.229	0.430	0.318	2.856	0.005	0.531	1.884
Number of years of schooling of spouse	0.182	0.050	0.362	3.652	0.000	0.669	1.496
Cultivated area of household land in acres	0.070	0.035	0.222	2.019	0.047	0.544	1.837
Proportion of dependants	-0.033	0.009	-0.303	-3.576	0.001	0.916	1.092
Fishing for income	-1.754	0.763	-0.194	-2.299	0.024	0.929	1.076
Number of years of schooling of household head	-0.740	0.056	-0.128	-1.318	0.191	0.701	1.426

Table 4

a. Dependent Variable: dietary diversity score of household

ii). Number of Months Food is Available in Store			
Descriptive Statistics	**Mean**	**Std Deviation**	**N**
Number of months of food availability in store	9.134	2.360	97.000
Cultivated area of the household in acres	7.691	5.757	97.000
Number of years of schooling of spouse	3.290	3.608	97.000
Sell agricultural labor for income	0.140	0.353	97.000
Number of working persons in household	2.120	0.582	97.000
Age of household head	46.680	13.753	97.000
Percentage proportion of dependants	61.920	16.797	97.000
Non-Migrant dummy variable	0.530	0.502	97.000

Table 5

Model Summary				
Model	**R**	**R^2**	**Adjusted R^2**	**Std Error of the estimate**
1	0.598[a]	0.358	0.307	1.9648

a. Predictors: (Constant), Non-migrant dummy variable, age of household head, sell agricultural labor for income, number of working persons in household, number of years of schooling of spouse, percentage proportion of dependants, cultivated area of the household in acres.

Table 6

ANOVA					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	191.183	7	27.312	7.075	0.000[a]
Residual	343.575	89	3.86		
Total	534.758	96			

a. Predictors: (Constant), Non-Migrants dummy variable, age of household head, sell agricultural labor for income, number of working persons in household, number of years of schooling of spouse, percentage proportion of dependants, cultivated area of the household in acres
b. Dependent Variable: number of months of food availability in store.

Table 7