

THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

Role of Employment Income in Food Security in Commercial Sugarcane Farming Households in Mumias Division, Kakamega County, Kenya

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Abstract:

The role of employment income in food security in commercial sugar cane farming households on access to food security in Mumias East Division is a thorny issue especially recently as millers grapple with losses and delay in payment of farmers after cane deliveries to the millers. The study was founded on utility maximization peasant theory and sustainable livelihood approach framework. The specific objective of the study was to examine the effect of sugarcane income on household access to food security in Mumias East Division. This study employed a survey design targeting sugarcane farmers from Mumias East Division. There are approximately 8691 sugarcane farmers in Mumias East Division as shown in Mumias sugar company inventory. The study used a sample of 368 respondents based on Krejcie and Morgan formula for determination of sample size of research activity. Data was analyzed using statistical packages of social sciences (SPSS version 20). The finding indicated that there is a very small negative relationship between the employment income and household food insecurity scores.

Keywords: Employment income, food security, sugarcane farming, food security

1. Introduction

Commercial sugarcane farming is the main agricultural economic activity in Mumias East Division. Commercial sugarcane farming began in 1971 in Mumias, leading to a first output of sugar in 1973, the scheme being the most recent stage in government expansion of the sugar industry (Smith, 1978). Western Kenya has nine sugar processing companies, all competing for scarce arable land (Kenya Sugar Board, 2011). Time and again, expansion of plantation farming does not factor strategies in favour of biodiversity conservation and management of household food security in their planning (Waswa & Netondo, 2014). The households, which source sugarcane to these firms end up suffering dual tragedy: greater than before income insecurity and food insecurity. It is said food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (WFS, 1996). This study began with a supposition that food insecurity in Mumias is a problem of both food supply and demand. Food consumption is not only affected by the food production component but is also affected by the effective demand of the rural household. The effective demand is influenced mainly by income.

2. Background

According to Richard, Ernst-August and Ali (2015), this sub-sector holds a key position in the Kenyan Agricultural sector. It provides direct and regular employment for about 40,000 workers. The sector indirectly employs thousands of casual workers on farms as weeders and cane cutters among others. Nearly 80% of Kenya's population lives in rural areas and deriving their livelihood from agriculture. This population depends on agriculture for food and income and for them agriculture sector will continue to play a key role in improving food security and reducing poverty (Kiriti, Gitau & Olunga 2013).

Access to food security by a household is further affected by household food purchasing power; which is a factor of both household non-farming income and household farming income, (Wiggins, et al. 2015). According to Mabuza (2016), households that relied predominantly on on-farm generated income had a significantly better food security status than their counter-parts who derived most of their income from remittances and nonfarm economic activities.

Off-farm income is income originating away from the family farm (e.g., wages/salaries from agricultural and non-agricultural wage labor). Households with a larger proportion of better-educated members (both secondary and tertiary training) were likely to participate in the nonagricultural sector, particularly in wage employment or private businesses operated within the community (Mabuza, et al. 2016). Households that relied primarily on off-farm-generated income were less likely to employ food insecurity coping strategies when compared to their on-farm-dependent counterparts. Households may also decide to allocate their land to sugarcane production to obtain cash income. This income can be used

to purchase non-food and food items-It is that portion of household income that is spent on food that enhances food intake and if income continues to decline, then food intake may be affected.

For households in Mumias East Division that practice commercial sugarcane farming, doubling current yields would be of significance in bettering income in the short and medium term. This option will however be constrained by unaffordable inputs, declining land sizes due to pressure to accommodate non-farming functions imposed by increasing population, and due to limited extension services for reasons that are beyond their reach. The single most important option left for small-scale sugarcane farmers is intensive sustainable agriculture through crop diversification (Waswa et al., 2012).

3. Research Methodology

This study adopted a survey design as it required original information from the respondents. Survey refers to the method of securing information concerning a phenomenon under study from all or a selected number of respondents of the concerned universe (Kothari 2004). The population consisted of all farmers from Mumias East Division. Target population consisted of commercial sugarcane farming households within Mumias East Division. According to Kenya Sugar Research Foundation (KESREF), now Sugar Research Institute, (SRI) 2002 reports, Mumias Division has 8691 contracted commercial sugarcane farmers, therefore 8,691 commercial sugar cane farmers will form the target population. Sample frame was drawn from commercial sugar cane farmers from Mumias East Division. For ease of field data collection, farmer inventory was acquired from Mumias Sugar Company Limited' Agriculture Management System that contains all active commercial sugarcane farmers in Mumias East Division. The study used a sample of 368 respondent based on Krejcie and Morgan formula for determination of sample size of research activity, as shown in Appendix. It was also appropriate for homogeneous population like commercial sugarcane farming households of Mumias East Division. Primary data was collected using questionnaires that measure the role of commercial sugarcane farming on household food security in Mumias East Division. Data was collected by self-administered questionnaire. Self-administered method requires a person known as the interviewer asking questions generally in a face-to-face contact to the other interviewee (Kothari 2004). Data analysis is the process of systematically applying statistical and or logical techniques to describe or illustrate. The overall goal of data analysis in field observation is to arrive at a general understanding of the phenomenon under study (Tayie 2005). After collecting data from the field, the information was studied, selected, coded and fed into the Statistical Package for Social Sciences SPSS 20 software for analysis. Data was then analyzed using descriptive statistics focusing on frequency tables and percentages to analyze information on the role of commercial sugar cane farming on access to household food security. Inferential statistics included use of correlation and regression analysis to establish the relationship between employment income and commercial cane farming household food security.

4. Results and Findings

The result from data analysis and discussion of the finding are shown here based on the collected data from the sample of 229 households and makes an inference of the whole population. The objective is pictured clearly in this chapter by looking at different questions asked to the respondents.

The analysis is divided into two sections namely; descriptive statistics and inferential statistics. The descriptive statistics of the analysis helped in gauging the different measures of central tendency and dispersion in the results. Inferential statistics made use of correlation and regression analysis tool. The data was entered, cleaned and analyzed using Statistical Package for Social Scientists (SPSS).

4.1. Role of Sugarcane Farming on Household Food Insecurity Access

This descriptive analysis included checking on the various variables that measured food insecurity and the role employment income commercial sugarcane farming households in Mumias East Division. All the questions in these sections were analyzed on a Likert scale of 5 points. The five-point Likert scale included strongly agree=1, Agree=2, Not sure=3, Disagree=4, Strongly disagree=5. Measure of central tendency and measures of dispersion were taken on these variables.

Statement	5	4	3	2	1	Mean	Std. Dev
1. I spent most of my sugarcane farming employment income on farm production of food for my household	146(63.8)	33(14.4)	20(8.7)	21(9.2)	8(3.5)	4.26	1.161
2. I spent most of my sugarcane farming employment income on purchasing food for my household	101(44.1)	52(22.7)	22(9.6)	49(21.4)	4(1.7)	3.86	1.243
3. Most of my sugarcane farming employment income is spent on assets that buffer my household when there is scarcity of food Valid N listwise=228 Grand mean=4.20	169(73.8)	24(10.5)	17(7.4)	13(5.7)	5(2.2)	4.49	1.004

Table 1: Role of Commercial Sugarcane Farming Employment Income and Household Food Security

The results on table 1.0 shows that on the issue on whether farmers spent most of their sugarcane farming income on farm production of food, 3.5 percent of the farmers strongly disagreed that they spent most of their sugarcane farming employment income on farm production of food for their household, 9.2 percent disagreed, 8.7 percent were of no opinion, 14.4 percent agreed and 63.8 percent strongly agreed. Most of farmers strongly agreed. The scores had a mean of 4.26 showing most agreed and a standard deviation of 1.161.

In relation to whether the farmers used most of sugarcane farming employment to purchase food, 1.7 percent of the farmers strongly disagreed that they spent most of their sugarcane farming employment income on purchasing food for their household, 2.4 percent disagreed, 9.6 percent were of no opinion, 22.7 percent agreed while 44.1 percent strongly agreed. Majority of the farmers strongly agreed. This had a mean of 3.86 show most agreed and a standard deviation of 1.243.

In relation to whether the farmers used most of their sugarcane farming employment income on assets that household during food scarcity, 2.2 percent of the farmers strongly disagreed that most of their sugarcane farming employment income is spent on assets that buffer their household when there is scarcity of food, 5.7 percent disagreed, 7.4 percent were of no opinion, 10.5 percent agreed while 73.8 percent strongly agreed. The farmers who responded that they strongly agreed had the highest number. The mean was 4.49 indicating that most of the farmers strongly agree and a standard deviation of 1.004. The farmers gave very high scores for the question while the other responses had a deviation of 1.004 from the mean. The variable had a grand mean of 4.20 indicating that most farming households agreed to the questions.

4.2. Correlation Analysis between Commercial Sugarcane Farming Employment and Food Insecurity

		EI	HFIAScores
EI	Pearson Correlation	1	-.090
	Sig. (2-tailed)		.001
	N	228	228
HFIA scores	Pearson Correlation	-.090	1
	Sig. (2-tailed)	.001	
	N	228	229

Table 2: Correlation between HFIA and EI

In the correlation analysis of table 2.0 of employment income and household food security produced a Pearson correlation coefficient of -0.090. This implies that there is a very small negative relationship between employment income and food insecurity score. If one variable increases it leads to decreasing of the other variable by a very small change.

The p value is less than 0.05. This implies that the correlation is significant between the two variables at 5% level of significance.

4.3. Regression of Role of Employment Income on Food Security

The specific objective number one was to check the effect of employment income on household food insecurity.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.727	1.775		6.044	.000
	EI	-.187	.137	-.090	-1.360	.175

Table 3: Regression of Role of Employment Income on Food Security

From table 4.14, the constant output indicates that without factoring in the effect of employment income the household food insecurity score will be at 10.727. A parameter estimate of -0.187 indicates that an increase in one unit of employment income, reduces the household food insecurity score by 0.187

4.4. Model fitting and significance of the parameters

The parameter of employment income is not significant at 5% level of significance since its p value is greater than 0.05.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.090 ^a	.008	.004	5.70163

Table 4: R Square

Table 4 shows the R square for the model was 0.08, this implies that 0.8% of the variation in household food insecurity is explained by employment income in this model.

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	60.123	1	60.123	1.849	.175 ^b
	Residual	7346.930	226	32.509		
	Total	7407.053	227			

Table 5: ANOVA

The p value of 0.175 from table 5 denotes that the variation in household food insecurity is not explained well by the employment income. This supports the R Square. This is not a good model.

5. Conclusion

It is very clear from the analysis that there is no significant relationship between employment income and food security state. Employment income explains very small change in household food insecurity scores. Employment income cannot be used in prediction of household food security.

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Appendix

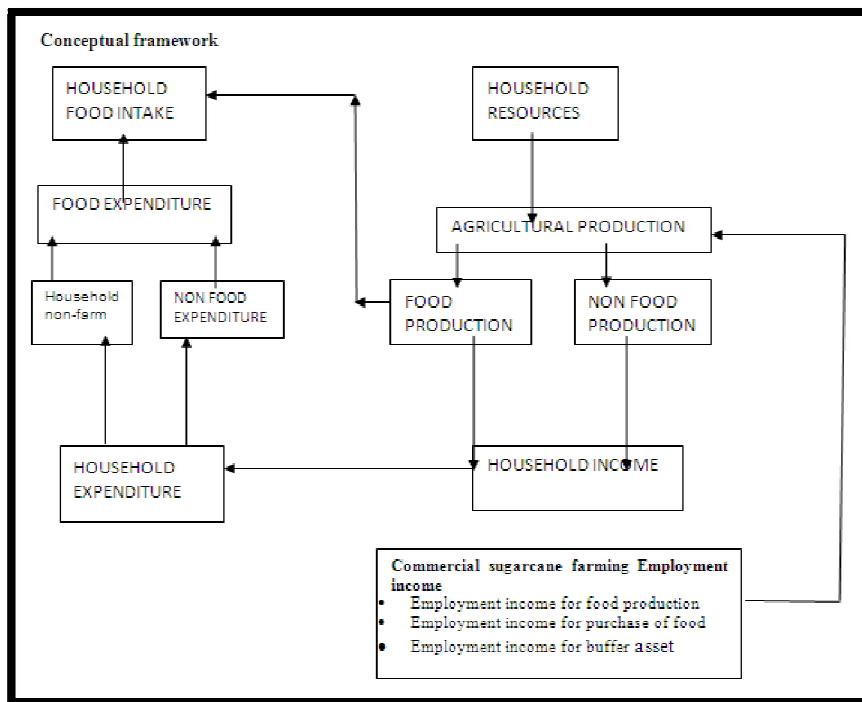


Figure 1: Conceptual Framework

Krejcie and Morgan Formula for Determination of Sample Size

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	187	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Table 6: Determining Sample Size from a Given Population

Note: 'N' Is Population Size

'S' Is Sample Size

Krejcie, Robert v., Morgan, Daryle W., 'Determining sample size for Research Activities', Educational and Psychological Measurement, 1970.