DOES TANZANIA SOCIAL ACTION FUND INTERVENTION A PANACEA TO FOOD INSECURE VULNERABLE RURAL POOR PEOPLE?

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Abstract.

Development intervention is increasingly reported as a means of improving the livelihoods of the vulnerable poor people. However, little information on what could have been happened if there could be no intervention is available. This study was conducted to assess the livelihood impact of Tanzania Social Action Fund intervention in Agriculture for vulnerable communities in Makete and Rungwe Districts. This research examined whether intervention in food security is a panacea for the vulnerable communities. A quasi-experimental design was used to collect a sample of 239 and 115 recipient and non-recipient households and triangulation approaches were employed, respectively. Paired *t*-test, chi-square test and phi-coefficient were used to ascertain the significance of the means of differences, comparing sample variance and strength of relationship between qualitative variables, respectively. Results showed that recipients were food insecure than non recipients. Based on these findings, it is concluded that intervention on food security through participation is not a panacea to vulnerable communities. Therefore, it is recommended that intervention should be on prevention basis rather than coping strategies.

Key words: Food security, intervention, vulnerability, food insecurity pattern, marketing channels and marketing points.

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1.0 Introduction

Food security is achieved 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 (World food summit 1996 cited by Clay 2002). However, food security is built in three pillars: (a) food availability in which sufficient quantities of food are available to people on a consistent basis; (b) food accessibility whereby people have sufficient resources to obtain appropriate foods for a nutritious diet and (c) food utilization means people have sufficient knowledge of nutrition and care practices and access to adequate water and sanitation to derive sustenance food (New Partnership for Africa's development 2004, Nazir et al 2010).

Food availability in Tanzania is characterized by domestic production, of which 95% of the country's food requirements are met with local production (Manyong and Gerken 2009). The agricultural sector is dominated by smallholder farmers, who grow 75% of the national food whereas 82 % and 76 % of adult men and women respectively are employed (Food and Agricultural Organization 2008, Mngodo 2008, Manyong and Gerken 2009). Although, Tanzania has a large untapped agricultural potential, yet it is a net importer of foods (Wolter, 2008, Nazir et al 2010). However, the country has a comparative advantage in the production of both tradition and non-traditional export crops. Therefore, there is a large potential for increasing production of food crops such as wheat and rice to replace food imports (United Republic of Tanzania, 2001).

Although, low labour productivity, poor coordination and limited capacity, underdeveloped supporting facilities, dependency on rainfall agriculture, inappropriate technology and impediments to food market access are threats that face agriculture in Tanzania (United Republic of Tanzania 2001). Hitherto, after independence in 1961, the Government developed a policy of national self-sufficiency which was vigorously pursued. An official marketing channel for main food staples comprised farmers, primary cooperative societies, regional cooperative unions, the National milling corporation(NMC) and consumers were organized (New Partnership for Africa's development 2004). The government attempt to increase food crop production and advance food self-sufficiency through interventionist policies did not have the desired result (New Partnership for Africa's Development 2004).

2.0 Statement of the problem

The implementation of District Agricultural Development Project (DADPs), the District Agricultural Sector Investment Project (DASIP), the Participatory Agricultural Development and Empowerment Project (PADEP) supported communities in implementing Agricultural Projects and Agricultural Marketing Systems Development Programme (AMSDP), however its results have been slow (United Republic of Tanzania, 2009). With all these government efforts, rural households face labour shortage due to rural-urban migration because of non-farm employment opportunities, HIV and AIDS and malaria pandemics as a result agricultural labour force grows at less than 2.8% per annual (United Republic of Tanzania 2001, 2006). Moreover, drought is the most shock experienced by the majority of food insecure households followed by high food prices and serious illness in Tanzania (Ehrhart and Twena 2006). It is reported that 15% of households are food insecure and highly vulnerable, respectively. However, food insecurity and vulnerability varies greatly by group and location in Tanzania. Hitherto, poor income, wage labourers, small farmers, remittance and natural resource dependants all have 39-47% households that are food insecure or highly vulnerable (Mckinney 2006) although higher food volatility exposes both primary producers and consumers at a higher risk of becoming poor (Kiratu et al 2011)

Consequently, poverty is still a challenge in rural areas where 38% of the population lives below the basic needs poverty line compared with 24% in urban areas (Food and Agricultural organization 2008, United Republic of Tanzania 2010). Rural growth of the agricultural sector is about 4.5% contrary to the national population growth rate of 2.9, therefore the rural per capita income becomes small (United Republic of Tanzania 2010). Thus, poverty contributes to food insecurity, which contributes to poor nutrition, health and cognitive development then again contributes to poverty (Nazir et al 2010). Therefore, the National Strategy for Growth and Reduction of Poverty (NSGRP I and II) aims at enhancing growth and reduction of income poverty by improving food availability and accessibility, hence reducing income poverty of the vulnerable needy groups through various intervention programmes (United Republic of Tanzania 2000, 2005, 2010). As a result, in the year 2000 Tanzania Social Action Fund (TASAF) was introduced to address the imbalance by empowering communities for effective and efficient utilization of the productive assets created (World Bank 2006). However, little information on

what could have been happened if there could be no intervention is available. Therefore, this research examined whether TASAF intervention is a panacea for food insecure vulnerable communities in Makete and Rungwe districts to provide feedback to policymakers and recipients at large.

3.0 Methodology

In estimating *ex-post* impact assessment, experimental and quasi-experimental designs were considered. The first design could be applied within a subset of equally eligible beneficiaries while reaching the most eligible and denying the least eligible (Baker 2000). However, this could be unethical owing to the denial of benefits to other eligible members and difficult to ensure that assignment could be truly random (Baker 1999, 2000). Therefore, quasi-experiment approach was employed in which a control group that resemble the treatment at least in observed characteristics was constructed. Moreover, Ashley and Hussein (2000) argue that key features of impact assessment are on cross-checking multiple types of data, both qualitative and quantitative. Thus, the combined methods of qualitative analysis in impact assessment yield credible results (Garbarino and Holland 2009). Therefore, conversational interviews with key informants, focus group discussion with beneficiaries and participant observation in targeted communities qualitative tools were complemented by semi-structured interview schedules (Baker 2000, Adams 2001, Swan 2004, Wassenich and Whiteside 2004, Adam 2006, La Rovere and Dixon 2007).

Furthermore, a modified DFID (1999) sustainable livelihood (SL) conceptual framework was adopted for intervention of livelihood analysis. The study employed a quasi-experimental approach (Power and Riddell 1998, Baker 1999, Baker 2000, Hulme 2000, Spath 2004, Grossman 2005) in which cross-sectional data were collected once at a given point of time (Wooldridge 2001, Baker 2003, Stocks and Watson 2003). The sample based on precision of 5% and confidence level of 95% for infinite population was determined using the traditional formula (Power and Riddell 1998):

$$n = \frac{1.96^2 \left[p(-p)\right]}{SE^2} \quad \ldots\ldots (1)$$

was applied, whereas "n" is a sample size of 300 households calculated and 54 key informants, SE is the tolerable standard error (0.05), and p = (0.64) and (1-p) = (0.36) were the proportion of projects participants and non-participants, respectively. Since all districts in Tanzania adopted intervention programme for various target groups, thus multistage and non random stratified sampling techniques were employed to obtain a representative sample.

Stratified list of participants: food insecure (FI), community development investment (CDI), vulnerable groups (VGs) and service poor (SP) projects were used as the sampling frame. Thus far, 192 recipients, 108 non recipients and key informants were surveyed and statistical package for social sciences (SPSS) and STATA versions were used for data analysis. To ascertain the differences between recipients and non-recipients, paired t-test as a difference test based on t-distribution was used for judging the significance of the mean of difference between the treated and the control groups and chi-square based on chi-distribution was also used for comparing a sample to a theoretical population variance (Kothari 2004). Moreover, the phi-coefficient was preferable to chi-square as a test of association between two qualitative variables. According to Bryman and Cramer (1997) this statistic measure is similar to the correlation coefficient in that it varies between zero and ± 1 to indicate the strength of relationship, given by the formula:

$$phi(\phi) = \sqrt{\frac{chi - square}{numberofcases(N)}} \quad \text{......} \quad (2)$$

Its interpretation was similar to Pearson's r. This was simply the square of phi value multiplied by 100. It provided an indication of how far variation in one variable was accounted for by the other (Bryman and Cramer 1997).

4.0 Results and discussion

4.1 Socio- economic characteristics of respondents

Results (Table 1) showed that 33.4% and 29.7% of the respondents were in the age category of 30-44 and 45-59, respectively. This indicates that respondents in these age categories were most likely to participate in productive assets created in comparison to 10.3% and 7.3% of age class 15-29 and 75-89, respectively. Among respondents interviewed 46.3% and 53.7% were female and male in the same order from Makete and Rungwe districts. Unequal distribution of the

number of female and male respondents in both districts advocates that men had a greater chance of participation than women. Their differences in participation were mostly likely attributed by the nature of projects created in both districts.

Furthermore, findings (Table 1) showed that 56.3% and 20.7% of the households interviewed were male headed and single parents respectively; however, the trend was similar in both districts. Results on female headed households agree with observations made by National Bureau of Statistics (2009) on its household budget survey (HBS). Results in both districts show that 66.3% were married and 2.3% were widowers. Meaning that, married counterparts were the likely recipients of TASAF intervention. Therefore, differences in project participation of those beneficiary groups could have been attributed to their vulnerability.

Table 1: Socio-economic characteristics of the respondents

	Districts (n =300)

	Makete		Rungwe		Total	
Respondents	n	%	n	%	n	%
Participants	73	54.5	119	71.7	192	64
Non participants	61	45.5	47	28.3	108	36
Total	134	100.0	166	100.0	300	100.0
Age category						
15-29	6	4.5	25	15.1	31	10.3
30-44	41	30.6	59	35.5	100	33.4
45-59	46	34.3	43	25.9	89	29.7
60-74	30	22.4	28	16.9	58	19.3
75-89	11	8.2	11	6.6	22	7.3
Total	134	100.0	166	100.0	300	100
Sex						
Female	67	50.0	72	43.4	139	46.3
Male	67	50.0	94	56.6	161	53.7
Total	134	100.0	166	100.0	300	100.0
Household heads						
Male	73	54.5	96	57.8	169	56.3
Female	32	23.9	37	22.3	69	23
Single parent	29	21.6	33	19.9	62	20.7
Total	134	100.0	166	100.0	300	100.0
Marital status						
Single	6	4.5	11	6.6	17	5.7
Married	76	56.7	123	74.1	199	66.3
Widow	4	3	12	7.2	16	5.3
Widower	5	3.7	2	1.2	7	2.3
Separated	43	32.1	18	10.8	61	20.3
Total	134	100.0	166	100.0	300	100.0

Survey findings showed that 63.3% of respondents had attained primary education level of whom 0.3% had acquired post-secondary education. On the other hand, National Bureau of Statistics (2009) had similar results on the later education level of respondents. Thus, primary school leaver's constituted a large proportion of beneficiaries. Thus far, majority of participants were flexible and able to learn new skills needed in the established projects so as to sustain their livelihoods.

Findings showed that 94% of the respondents depend on agricultural activities to earn their livelihood. Therefore, agricultural sector remains the main employer of the majority respondents in the study area. However, 50.3% and 0.7% of respondents were able-bodied and orphans, respectively. Meaning that, able-bodied had a greater opportunity to participate in projects established than orphans. This could have been attributed to the type of projects that need active labour force participation such as rural road construction in service poor communities.

Furthermore, results showed that 94%, 30.7% and 25.7% of respondents depend on on-farm, off-farm and TASAF (Table 2), respectively. Meaning that, the majority of respondents entirely were depending on on-farm activities whereas less had diversified their sources of income. Probably, this had been caused by the lack of off-farm employment opportunities in the study area. Research findings concur with observations obtained by Davis et al (2009) in a cross-country study that less multiple activities are found in rural households in African countries compared to other continents. Similarly, observations made by Barbieri and Mahoney (2009) report that off-farm activities are driven by complex motives which are economic and intrinsic in nature.

Table 2: Main sources of income for households

Main Source of income	**Farming**	**Off-farm**	**Both**	**TASAF**		
Response	**n (%)**	**n (%)**	**n (%)**	**n (%)**		
Yes	282(94)	92(30.7)	46(15.3)	77(25.7)		
No	18(6)	208(69.3)	254(84.7)	223(74.3)		
Total	300(100)	300(100)	300(100)	300(100)		
Average monthly income (Tanzanian shillings)						
	Beneficiaries			**Non beneficiaries**		
Source	**n**	**Mean**	**std dev.**	**n**	**mean**	**std dev.**
Farm	33	43 212	56 093.54	22	32 590.91	19 087.91
Off-farm	15	47 933.33	47 404.74	8	62 250	101 392.80
Both	8	59 375	66 517.32	10	36 100	20 256.41
TASAF	14	53 946.43	35 600.91			
			Beneficiaries Vs non beneficiaries			
*Monthly mean income: Farm: t =0.854; Off-farm: -t=0.466; Casual: t =1.054; TASAF: t=8.475***						

***Significant at p<0.01. Figures in brackets are percentages.*

Moreover, findings (Table 2) showed that the mean monthly income earned between participants and non-participants was statistically significant at (p<0.01) level. It points out that those

TASAF participants earned more income than non-participants away from other sources of income in which they had an equal opportunity.

4.2 Staple food and cash crops grown

Findings (Table 3) showed that the mean production of wheat and round potato grown was significant at ($p<0.05$) level. On the other hand, the average production of beans ($p<0.05$), cassava ($p<0.05$), yams ($p<0.01$) and bananas ($p<0.01$) grown were also statistically significant. Meaning that, there were differences in average crops production between beneficiaries and non beneficiaries. The differences could have been attributed by agro-ecological variations. Observations made by Godfray et al (2010) report a wide geographic variation in crop productivity across regions that experience similar climate. Moreover, findings reflected that beneficiaries had a broad ranges of crops among which were drought resistant crops to earn their living. Therefore, crops productivity by beneficiaries about 1.44% to 6.05% could have been attributed by an intervention. However, yield variation occurred because of technical constraints in the use of farm inputs and market opportunities.

Table 3: Staple food and cash crops grown

	Beneficiaries(n=192)		Non beneficiaries(n=108)		
Crops grown	**Mean proportion**	**std dev.**	**Mean proportion**	**std dev.**	**Phi**
Maize	0.990	0.102	0.980	0.135	0.034
Wheat	0.370	0.484	0.510	0.502	-0.136
Beans	0.940	1.433	0.660	0.477	0.214
Cassava	0.430	0.496	0.310	0.463	0.120
Yams	0.470	0.501	0.260	0.44	0.211
Round potato	0.400	0.490	0.530	0.502	-0.127
Bananas	0.640	0.483	0.380	0.488	0.246
Maize yield/100kg	7.270	11.798	0.620	7.546	

Beneficiaries Vs non beneficiaries

food crops/cash crops grown: *Maize: t=0.586; wheat: -t = 2.363*; Beans: t=2.006*; cassava: t = 2.086*; Yams: t= 3.720**; R/potato:-t=2.219*; banana: t=4.390** and Maize yield /100kgs: t = 0.358.*

**Significant at p < 0.05, ***significant at p< 0.01*

4.3 Effects of TASAF support on household farm input

Respondents were asked to indicate their sources of seasonal farm inputs among the given alternatives. Results (Table 4) showed that TASAF support on household had a significant effect at ($p<0.01$) level on farm inputs. Meaning that, TASAF intervention had a positive association

with participants' farm inputs. This suggests that beneficiaries used their earned income from public works and other vulnerable projects to purchase farm inputs.

Table 4: Households source of farm inputs

	Beneficiaries (n=192)		Non beneficiaries(n=108)		
Source	Mean proportion	std dev.	Mean proportion	std dev.	Phi Association sign
TASAF assistance	0.180	0.388	0.000	0.000	0.240
Government subsidies	0.450	0.499	0.470	0.502	-0.023
Private traders	0.460	0.500	0.470	0.502	-0.013
Source of farm inputs: *TASAF assistance: t = 4.266**; Government subsidies: -t=0.404; Private traders:-t=0.231.*					

***Significant at p < 0.01*

4.4 Agricultural activities and marketing orientation of recipients

4.4.1 Attributes considered by households when planning for agriculture activities

The attributes the respondents took into consideration when planning for agricultural activities and possible reasons for their choice were asked. Survey findings (Table 5) showed that the average plan to use manure on their farms by recipients significantly ($p<0.05$) exceeded non-recipients. The differences in the use of manure between the two groups could have been attributed by fact that recipients had a prior plan to use organic manure. Therefore, the variation in use of manure by recipients was accounted for 1.96% by intervention. Zerfu and Larson (2011) had similar observations that rising fertilizer prices and low farm-gate prices for farm produce dampens the use of fertilizers by farmers. Also, the average prior plan for market price of farm produce, availability of input subsidies, weeds and weeding problems were indifferent between them. Meaning that, all were equally likely to have no prior farm plan on these attributes. Findings obtained by Mittal et al (2010) report that farmers have a prior search for market information on farm inputs and outputs before decision making.

Table 5: Attributes considered by households when planning for agricultural activities

	Beneficiaries (n=192)		Non beneficiaries (n=108)		
Attributes	**Mean**	**std dev.**	**mean**	**std dev.**	**Phi**
Availability of subsidies	0.33	0.471	0.31	0.467	0.014
Availability of manures	0.71	0.454	0.57	0.497	0.14
Market price of produce	0.44	0.497	0.43	0.497	-0.016
Weeding problems	0.87	0.337	0.82	0.383	0.062
Planning for agricultural activities:					

Availability of subsidies: t = 0.236; availability of manure: t= 2.439; market price of produce: t=0.280; and, weeding: t =1.073.*

**Significant at p < 0.05.*

4.4.2 Households marketing channels of farm products

Both recipients and non recipients were asked to indicate their marketing channels for their farm produce. Results (Table 6) showed that marketing of wheat, round potatoes and bananas were statistically significant at ($p<0.01$), ($p < 0.01$) and ($p<0.05$) levels, respectively. Meaning that, there were differences between participants and non participants on the channel of selling their crops. This could have been attributed by the differences in surpluses food produced and nature of crops such perishable and storable foods. Study findings are similar to observations made by Muto (2008) that majority of banana farmers sell their produce on farm.

Table 6: Marketing channels for households

	TASAF Beneficiaries (n=192)				Non beneficiaries(n=108)			
Mkt channels	**M/men**	**P/traders**	**Market**	**Total**	**M/men**	**P/traders**	**Market**	**Total**
Crops	n %	n %	N %	n %	n %	n %	n %	n %
Maize	52(17.6)	28(9.5)	44(14.9)	124(64.6)	20(6.8)	16(5.4)	42(14.2)	78(72.2)
Wheat	5(3.8)	8(6.1)	14(10.6)	27(14.1)	4(3.0)	8(6.1)	32(24.2)	40(40.7)
Bananas	69(51.9)	17(12.8)	6(4.5)	92(47.9)	16(12)	0(0)	1(0.8)	17(15.7)
R/potatoe	6(4.5)	10(7.5)	10(7.5)	26(13.5)	4(3)	8(6)	37(27.6)	49(45.4)
Rice	5(18.5)	0(0.0)	8(29.6)	13(6.8)	3(11.1)	1(3.7)	1(3.7)	5(4.6)
Total	**137(71.3)**	**63(32.8)**	**82(42.7)**	**282(146.9)**	**47(43.5)**	**33(30.5)**	**113(104.6)**	**189(175)**

Beneficiaries Vs non beneficiaries:

Maize: $\chi^2 = 9.310$, df= 4; wheat: $\chi^2 = 18.454$, df = 4; p <0.01; banana: $\chi^2 = 10.389$, df =4, p<0.05; R/patato: $\chi^2 = 36.111$, df = 3, p < 0.01; and Rice: $\chi^2 = 7.564$, df= 4.

Note: Mkt = Market; M/men= Middle men; P/traders = Private traders. Figures in brackets are percentages.

Of all the market channels surveyed, results showed that 104.6%, 47% of non beneficiaries and 71.3%, 42.7% of beneficiaries sold their multiple crops direct to the market or through the middle-men, respectively (Table 6). Study findings are consistent with observations made by Taylor et al (2008) that different market channels matter for different poor people in rural areas to maximize their welfare and the path out of poverty trap.

4.4.3 Average market price of crops

Respondents were asked to give the selling prices of their crops per unit of 100 kg. Results (Table 7) showed that the mean prices were equally likely for those crops grown by beneficiaries and non beneficiaries. Meaning that, market prices do not distinguish between crops grown by beneficiaries or non beneficiaries. Thus, beneficiaries could have gained over non beneficiaries through increased production.

Table7: Average market price of crops (in TZS).

	Beneficiaries (n=192)			Non beneficiaries (n=108)		
Crops /100Kg	**n**	**Mean prices(TZS)**	**Std dev.**	**n**	**Mean Prices (TZS)**	**Std dev.**
Maize	105	26 047.62	10 030.13	78	26 116.70	8944.7
Wheat	27	51 444.44	13 027.60	43	46 186.05	12 226.54
Bananas	69	2949.3	27 65.52	16	2500	547.72
Round potato	26	17 980.80	5223.9	49	20 408.20	19 333.60
Rice	9	43 333.33	26 457.51	5	33 600	3286.33

Beneficiaries Vs Non beneficiaries:

Mean price of maize: -t= 0.048; Mean price of wheat: t = 1.708; Mean price of banana: t =0.644; Mean price of R/potato: -t = 0.626 and mean price of rice: t = 0.805.

4.4.4 Households average distance from marketing point

Respondents were asked to indicate a distance from marketing point and a means of transport they used. Study findings (Table 8) showed that the mean distance from marketing point was statistically significant at ($p<0.01$) level. This advocates that there existed a difference between participants and non participants on accessing marketing points. Probably, beneficiaries operate in areas which are near to the market centres than non beneficiaries. Thus, the proximity to the marketing accounted for 11.76% by TASAF projects.

Table 8:Households average distance from marketing point

	Beneficiaries			Non beneficiaries			
Distance	**n**	**mean(Km)**	**std dev.**	**n**	**mean(Km)**	**std dev.**	**Phi**
	169	7.509	6.925	104	13.615	9.058	-0.343

*Beneficiaries Vs Non beneficiaries: -t=6.278**,*

***significant at p<0.01*

However, findings (Table 9) confirmed that the means of transport distance to the marketing points was also statistically significant at ($p<0.01$) level and that among other means of transport,

66.1% of participants accessed market services on foot compared to 47.2% of non participants. Therefore, easy access to the marketing points by beneficiaries was accounted for 12.11% by TASAF intervention. Pinstrup-Andersen (2009) had similar observations that market accessibility addresses the rural household welfare of food security.

Table 9: Households means of transport

	Beneficiaries(n=192)		Non beneficiaries(n=108)		Total	
Means of transport	**n**	**%**	**n**	**%**	**n**	**%**
Car	9	4.7	11	10.2	20	6.7
Bicycle	26	13.5	14	13.0	40	13.3
Donkey	2	1.0	4	3.7	6	2.0
Foot	127	66.1	51	47.2	178	59.3
Either of the above	9	4.7	17	15.7	26	8.7
None	16	8.3	11	10.2	27	9.0
Total	189	98.4	108	100	297	99

Beneficiaries Vs non beneficiaries

Means of transport: $\chi^2 = 35.964$, *df = 10, p < 0.01, Phi= 0.348*

4.5 Food insecurity pattern and main source of food products

4.5.1 Households average annual food insecurity pattern

Participants and non participants were asked to indicate months in the year round which they experienced food insecurity. Results (Table 10) showed that food insecurity pattern reached its peak in January and diminished as far as in March and increased again from September to December. Of all these months reported, September and December were significantly different from zero at ($p<0.01$) and ($p<0.05$) levels, respectively. Meaning that on average participants faced more food shortage than non participants and this might have been associated with low production hence poor precautionary food saving.

Table 10: Households' average food insecurity trend

	Beneficiaries (n=192)		Non beneficiaries (n=108)	
Months	**Mean proportion**	**std dev.**	**Mean proportion**	**std dev.**
January	0.690	0.463	0.600	0.492
February	0.590	0.492	0.590	0.494
March	0.250	0.434	0.340	0.477
September	0.170	0.378	0.060	0.247
October	0.230	0.421	0.170	0.374
November	0.420	0.495	0.360	0.483
December	0.570	0.496	0.440	0.498

Beneficiaries Vs non-beneficiaries food shortage

*January: t=1.596; February: t=0.02; March: -t =1.711; September: t=2.640**; October: t=1.283; November: t=1.030; and December: t=2.305**

*, **indicate significant levels at $p<0.05$ and $p< 0.01$, respectively (2-tailed).*

Observations made by Gedamu (2006) had similar findings that food-for-work interventions negatively affect time and resource allocations for participants' own production. Consequently, coping strategies were reported to be adopted by households as food security measures: work-for-food to their neighbours who were food secure, tea leaves picking, head-loading of timbers on daily basis, making local brewed alcohol, chopping firewood for sale, making wood-charcoal for exchange of food and migration to other areas where they could work and earn their livelihood.

4.5.2 Main source of households' food products in the year

Moreover, respondents were asked to indicate their main source of food items in the course of the year among the given alternatives. Research results (Table 11) showed that there were indifferent sources of food among respondents in the course of the year. Meaning that, beneficiaries like non beneficiaries were equally dependent on other sources of food away from farm to complement their dietary requirements.

Table 11: Households' main source of food items in the year

	Beneficiaries(n=192)		Non beneficiaries (108)		Total	
Source of food	n	%	n	%	n	%
Farm	18	9.4	8	7.4	26	8.7
Farm and shops	4	2.1	1	0.9	5	1.7
Farm and market	134	69.8	67	62.0	201	67
Farm and relief	1	0.5	4	3.7	5	1.7
Farm and others	0	0	2	1.9	2	0.7
Farm, shops , Market	28	14.6	24	22.2	52	17.3
Farm, market and relief	5	2.6	2	1.9	7	2.3
Total	190	99.0	108	100	298	99.3

$\chi^2 = 12.861$, $df = 8$. $Phi = 0.207$.

Of all the sources of food surveyed, 70% and 62% of recipients and non recipients respectively were depending on farm and market as their main source of food items. This suggests that farm and market dependency indicates either food surpluses or food insecurity of the respondents. Similarly, Pinstrup-Andersen (2009) observed that availability of food was linked to the production capacity of the households for consumption and market.

4.6 Number of meals and varieties of food consumed

4.6.1 Number of meals and average meals per day

Respondents were also asked to indicate how many times per day they had had their meals. Survey findings (Table 12) showed that there was equally likely in number and average meals consumed per day between beneficiaries and non beneficiaries. Therefore, both had a likelihood consumption pattern; however 60% and 57.4% of recipients and non recipients had two meals per day, respectively while only 2.6% of participants had one meal per day.

Table 12: Households number and average meals/day

	Beneficiaries (n=192)		Non beneficiaries(n=108)		Total	
Meals /day	**n**	**%**	**n**	**%**	**n**	**%**
Three times	72	37.5	46	42.6	118	39.3
Two times	115	59.9	62	57.4	177	59
One times	5	2.6	0	0	5	1.7
Total	192	100	108	100	300	100
Average meals/day	**mean**	**std dev.**	**mean**	**std dev.**		
	1.65	0.530	1.57	0.497		
Beneficiaries Vs non beneficiaries						
Meals /day $\chi^2 = 3.341$, *df =2*; *Average meals /day: t =1.235*						

4.6.2 Varieties of food consumed by a household per week

In addition to the number and average meals consumed per day, respondents were asked to indicate the frequency of food cooked or consumed in a household per week from a given food items. Results (Table 13) showed that beneficiaries significantly consumed different varieties of food items: banana ($p<0.01$), beans ($p<0.01$), milk ($p<0.05$) and fruits ($p<0.01$) than non beneficiaries per week. This shows that the recipients were endowed with a variety of and availability of food items. Thus recipients' choices were made between varieties of foods consumed and prevalent health issues to meet their dietary requirements as observed by (Babatunde and Adejobi 2010, Smith, 2010). Therefore, this accounts for TASAF intervention to mitigate health problems of participants.

Table 13: Varieties of food intake by household per week

	Beneficiaries (n=192)		Non beneficiaries (n=108)	
Food items	**mean**	**std dev.**	**mean**	**std dev.**
Thick porridge	6.020	1.933	6.060	1.718
Green vegetables	5.790	1.979	5.790	2.087
Bananas	3.150	2.894	1.710	2.348
Beans	3.620	2.576	2.800	2.468
Meat	0.910	1.059	1.170	1.329
Milk	1.990	2.623	1.230	2.147
Fruits	3.900	2.918	2.490	2.702
Rice	1.040	0.959	1.060	1.101
Sweet /round potato	2.380	2.425	3.460	2.850
Mixture maize/beans	1.090	1.093	1.810	2.155
Beneficiaries Vs Non beneficiaries				
*Thick porridge:-t =0.155; green vegetables: t=0.019; banana: t=4.394**; beans: t =2.715**; meat:-t =1.861; milk: t=2.559*; fruits: t=4.110**; rice: -t=0.114; sweet/round potato: -t= 3.482**; and ,mixture of maize and beans:-t=3.793**,*				

**Significant at p < 0.05, **Significant at p < 0.01*

On the contrary, non beneficiaries significantly consumed sweet / round potato ($p<0.01$) and mixture of maize and beans ($p<0.01$) more than beneficiaries. This shows that non participants depend mostly on cheap foods which are rich in carbohydrate and protein. Sarries and Raspsomanikis (2009) report that a low income household is more likely to shift consumption from normal towards inferior and less expensive foods.

Moreover, all respondents were most likely to consume thick porridge and green vegetables at most six times and less meat intake per week. This suggests that both beneficiaries and non beneficiaries were equally likely to maximize dietary and calorific intake by eating more green vegetables and thick porridge respectively. Results conform to Godfray et al (2010) and Wen et al (2010) support that a well-balanced diet rich in grains and vegetable products are healthful than meat and dairy products. Although, meat is regarded as superior food item respondents reported it to be expensive thus they could not afford to buy it even once per month. They normally eat meat once a year particularly during the Christmas or New Year celebration day. Inevitably they ate meat from wild animals or in case an animal had died unexpectedly as narrated below.

"*….an elder woman (80 years old in 2010) said, I used to eat meat of wild animals weekly when my husband and my sons were hunting. Unfortunately, my husband died and my sons also*

died because of HIV/AIDS, now I am alone with no body to take care of me…." (Translated from Kinga Vernacular language).

Hitherto, observations made by Godfray et al. (2010) report that meat represents the most concentrated source of vitamins and minerals important for young children. However, they discourage frequent intake of meat and other dairy products to avoid obesity problems. Therefore, respondents in the study area were involuntarily safe from obesity health problems. Nonetheless, consumption variations within respondents indicated differences in households' purchasing power. Thus, dietary intake basing on food varieties showed that beneficiaries were healthier than non beneficiaries. Inevitably, an improvement of recipients' health status could have been attributed to TASAF intervention.

5.0 Conclusions and recommendations

Based on the heeded research findings, married respondents especially male headed were more likely to participate while single parents were the least and most of them earned their livelihood from on-farm activities. Moreover, recipients and non recipients significantly sold their farm produce either to the market or to the middle-men depending on the nature of crops and the distance from their marketing points; therefore, it is concluded that on average beneficiaries were significantly food insecure than non beneficiaries particularly in September and December even if they were significantly endowed with a variety of and availability of food items. Thus, it is recommended that the government should create assets which enhance food security on prevention basis rather than coping strategies so as to strengthen recipients from adaptive capacity for increased resilience for food insecurity risk.

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