Research on Humanities and Social Sciences
ISSN 2222-1719 (Paper) ISSN 2222-2863 (Online)
Vol 2, No.8, 2012

Social Economic Factors Affecting Consumption of Sweet Potato Products: An Empirical Approach

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Abstract
The objective of the study was to analyze factors affecting consumption of value added products of sweet potato. The study was conducted in Shinyanga rural and Mwanza urban. Using cross sectional design, the study employed individual interviews, focused group discussions; review of relevant practical documents and discussions in data collection from a total of 200 surveyed households. Data collected was summarized using Statistical Package of Social Science (SPSS) windows versions 18.0.Analyses of the factors hypothesized to influence the consumption of sweet potatoes was carried out using multiple regression analysis. The goodness of fit of the model which is high as measured using coefficients of determination (R^2). The higher value of R^2 suggests that variables included in the model explained about 73% of the variations in the dependent variable. The F –Value is significant, indicating that the explanatory variables were statistically significant in explaining variation in the dependent variable. Furthermore, Variation Inflation Factor confirms absence of serious collinearity problem. Similarly, Durbin Watson test confirms the absence of autocorrelation. Furthermore, the data revealed that the sizes of land owned and education level are highly statistically significant at ($p < 0.01$) and statistically significant ($p < 0.05$) respectively. Hence there is need for farmers to increase the land area for sweet potatoes production to medium scale. Regarding to sweet potato prices it was found to vary from one node to another. However, there are a number of challenges facing the development of the sweet potato industry in Tanzania. The chronic shortage of seed is the most important challenge that needs to be dealt with (33.1%). Others were lack of capital (26.8%) unpredicted weather and pests/insect attack were the most critical challenges facing the subsector.
Keywords: Sweet potato, value added products, consumption, Michembe, Matobolwa

1. Introduction and Background Information

1.1 Background to information

Sweet potato[3] is a major staple food and a source of income in several regions of Tanzania and elsewhere in East Africa. However, Sweet potato is among under-exploited food crops in Africa (Ndunguru, 2003). Sweet potatoes are grown in most parts of the country, but the main production zones are found in the Lake Zone, Southern Highlands and the Eastern Zone (URT, 2007). According to the Food and Agriculture Organization (FAO) statistics, the world production of the crop in 2004 was 127 million tonnes a large amount of which came from China, with a production of 105 million tonnes**.** Nearly, half of the sweet potatoes produced in Asia are used for animal feed, with the remainder primarily used for human consumption, either as fresh or processed products. Sub-Saharan Africa produces more than seven million tonnes of sweet potatoes annually, which constitutes 5% of global production (Ewell, 2002). Africa's main producers of sweet potatoes are Uganda (1.7 million tonnes) and Nigeria (1.6 million tonnes) followed by Tanzania (1.3 million tonnes) (FAO, 2004).

2. Literature review

According to Gichuki *et al.,* (2005) in Tanzania, sweet potato is processed into two main products namely, "Michembe", where the roots are withered, i.e. cut into slices and dried and "Matobolwa", where the roots are boiled, sliced and dried; both of these products can last for 5 up to 10 months. Other products that can be prepared from sweet potatoes in Tanzania include cake, chapattis, doughnut, kalimati, meal flour, porridge and crisps.

Further research (Engoru, Mugisha and Bashaasha, 2005) On their study on characterization of tuber utilisation among sweet potato producers in eastern Uganda analyzing their data using SPSS for frequencies and descriptive statistics, found that all potato farmers consume part of their produce while still fresh (unprocessed). About 46.1 % of the farmers process their fresh sweet potato tubers, into various products. The processing

[3] *Ipomoea batatas*

generate two primarily products locally called *inginyo* and *amukeke*. Further processing of these two secondary products produces *amukeke* flour and *inginyo* flour. As reported by Bashaasha and Scott (2001), it is very likely that the over-riding motive for processing sweet potato is not entirely for profit making but rather for a number of other objectives including household food security, emergency income security and the need to circumvent a limited and erratic nature of fresh sweet potato market. The other 53.9% of the farmers who did not process any of their sweet potatoes attributed their practice mostly to lack of the necessary processing knowledge and land shortage to produce enough sweet potatoes. About half of the farmers (48.7%) reported to be storing their sweet. About 52.9% of the farmers at least sold a portion of their produce. Moreover, the study revealed that processed sweet potatoes have clear marketing advantages over fresh sweet potato tubers. However, in Shinyanga and Mwanza regions the crop is commonly processed into *"Michembe*" and "*Matobolwa"*.

According to the Food and Agriculture Organization (FAO) statistics (2004), there is also the potential for sweet potato production in the USA, Japan and India where the sweet potato is made into bread pudding, casserole, tart, muffins, scalloped sweet potato and refrigerated sweet potato pieces which are sold in the supermarkets. Further study by Ndunguru (2001), consumer and traders in Mwanza and Shinyanga preferred sweet potato tubers which are wholesome and free from infestation. However, the valuation made on sweet potato showed that broken, cut, and weevil infested tubers are sold at discounts of 12.1%, 14.2% and 36.3% respectively. Hence, the famers sustain big loss when the product is infested as opposed to when it is broken or cut into pieces. It was realized that quality losses of sweet potato tuber were due to operations related to handling and transportation. It was observed further that broken sweet potatoes tubers and skinning injury increased significantly ($p \leq 0.001$) during to handling and transportation from Gairo the producing area to Dar-Es-Salaam the consuming centre. This study observed that it is because of the same situation that compelled consumers and traders in Shinyanga and Mwanza to prefer sweet potato tubers which are wholesome and free from infestation and of reasonable sizes.

In Tanzania yield levels of sweet potatoes is approximately 6 metric tons per hectare on dry weight basis (Smith, 2004). In the lake zone regions the product is sometimes mixed with groundnuts to make porridge for family consumption. This paper is in line with Tanzania Agricultural Food Security Investment Plan (TAFSIP), Agriculture Sector Development Plan (ASDP) and "Kilimo Kwanza" (2011) that promote Agriculture and food security in the country in an attempt to alleviate poverty.

3. Methodology

This section explained the methodology used in conducting the study and justification for using those methods. It describes the rationale for the selected techniques and procedures and data collection methods and data analysis. The study was cross sectional in design. Data collected was summarized using Statistical Package of Social Science (SPSS) windows versions 18.0. Both primary and secondary data were collected. Structured and semi-structured interviews were administered to farmers, transporters, processors and traders and consumers.

3.1 Location

Shinyanga district council is one of the eight councils in Shinyanga Region. The council lies between latitudes 3º 20' and 3º 95' south of the equator and longitudes 31º 30' and 33º 30' East of Greenwich Meridian. Sweet potato is also a less preferred drought-resistant crop with a low value-to-bulk ratio.The District council shares boundaries with Kishapu and Shinyanga Municipal Councils in the East, Kahama and Geita in the West, Kwimba and Mwanza in the North, and Nzega Districts in the South (URT, 2002).Moreover, Mwanza region is boarded in North - Ukerewe district, lake waters, East - Magu district, South - Misungwi district, West - Sengerema district and lake waters. The climate is moderated by Lake Victoria and rainfall is more than 900 mm per annum but still unreliable. It is fairly humid but still tropical with marked division between dry and wet seasons. Two rain periods are experienced (URT, 2002).

3.2 Regression analysis

The study employed a multiple regression model to examine the effects of dependent variable into independent variables (Gujarati, 1995). In this study, the estimated quantity of sweet potato value added products consumed (QTYsp) were related to various explanatory variables so as to analyze statistical relationship between quantities of sweet potato value added products consumed related to these explanatory variables.

The equation can be written as follows;

Equation 1: $QTYsp_i = \beta_0 + \beta_1 ASPs_+ \beta_2 AVALPsp + \beta_3 QTYPsp + \beta_4 PCLPsp + \beta_5 PCFsp + \beta_6 HINCM + \beta 7\ EDUC + \beta_8 LS + \beta_9 AMSp_+ \beta_{10} THHM + \mu_i$

Where:

(β_1 and $\beta_2 \ldots \beta_{10}$) are Partial regression coefficients and others were variables of interests to be determined

β_0= parameter estimates (constant)

μ_i = is the stochastic disturbance term

4. Results and Discussion

4.1 Introduction

This section presents the results of the study in various forms including percentages, statements, tables and figures. The results presented are based on the objectives of the study which guided the type of study questions. The discussion that follows is based on the interpretation of the trend shown by the results and the reasons thereof.

4.2 Sweet potato production

4.2.1 Characteristics of sampled sweet potatoes producers/processors

4.2.1.1 Age of the respondents

The results revealed that (42%) of the sampled respondents aged was ranged from 28 years to 72 years and majority of the respondents were in between 40-50 years old (Table 1). This showed that the respondents were adult who engage in production. This is active age group with probable family responsibilities. Age had implication on the roles and responsibilities in the society (Kabuje, 2008).

Table 1: Age of sampled respondents

Age category	**Number**	**Percentage**
28.10	33	22.0
29-39	42	28.0
40-50	58	38.7
51-61	10	6.7
62-72	7	4.7
Total	**150**	**100.0**

Source: Own survey, 2012

4.2.1.2 Family size

The household size has great bearing on the amount of sweet potato processed, purchased and hence consumed. In general, a large size household would spend more on processed products than a small size household, *ceteris paribus*. As can be seen from Table 2, the average household size of 6.7 persons for all sampled respondents was larger than the National average household size of 4.9 (URT, 2007). Regarding the household distribution by size, majority of the sampled household sizes were between 2 and maximum of 14 persons per household. Also, further increase in household size at the current level of income would worsen the food security status of households in the study area.

Table 2: Mean of total household members

Variable	**Range**	**Min**	**Max**	**Mean**	**Standard Deviation**
Total household members	12.00	2.00	14.00	6.66	2.912

Source: Own survey, 2012

4.2.1.3 Gender

Regarding to gender the data revealed that 55.3% of the sampled respondents were female and 44.7% were male, one can conclude that women engage more in sweet potato production than male. However, there is negative perception as female crop; Most of the interviewed farmers perceived sweet potatoes as female crop because it does not command a place over maize or cotton in the market. As result many women use it for household food security when a maize harvest fails (Table 3). The current Commonwealth 'Gender Mainstreaming' policy applied to agriculture is a deliberate attempt to consider the different needs and circumstances of male and female farmers, and use same as criteria for fashioning out agricultural and rural development strategies for greater productivity (Commonwealth Secretariat, 2003). Gender has been recognized as an essential variable for analyzing the roles, responsibilities, constraints, opportunities, incentives, costs and benefits in Agriculture (Jiggins, Samanta and Olawoye 1997), women engage in a multiplicity of farm activities some of which were hitherto exclusive preserve of men. The increased feminization of agriculture is as a result of men's rural-urban migration in search of paid employment leaving agriculture in the hands of women (FAO, 1998).

Table 3: Gender of sampled respondents

Age	Number	Percentage
Male	67	44.7
Female	83	55.3
Total	**150**	**100.0**

Source: Own survey, 2012

4.3 Social economic factors affecting consumption of sweet potato value added products

4.3.1 Multiple regression model analysis

The study employed a multiple regression model to examine the effect of dependent variable into independent variables (Gujarati, 1995). In this study, the estimated quantity of sweet potato value added products consumed (QTYsp) was related to various explanatory variables as follows:

Partial regression coefficients were determined as shown below (β_1 and $\beta_2 \ldots \beta_{10}$)
β_1= - 0.526; β_2= 0.294; β_3= - 0.203; β_4= - 0.011; β_5= - 0.048; β_6= -0.308; β_7= - 0.718; β_8= 0 .707

β_9= 0.412 and β_{10} = 0.248

β_0 (Constant) = 1 728.982
Hence the econometric equation was; Equation 2:

$$QTYsp = 1728.982 - 0.526\,\beta_{1+} 0.294\,\beta_2 p - 0.203\,\beta_3 - 0.011\,\beta_4 - 0.048\,\beta_5 - 0.308\,\beta_6 - 0.718\,\beta_7 + 0.707\,\beta_{8+} 0.412\,\beta_9 + 0.248\,\beta_{10} + 431.94344$$

Table 4 shows that the coefficient correlation between variables is significant. A Land size owned by household is statistically significant ($p < 0.01$) and number of years in school (Education level) is statistically highly significant at 5% level ($p < 0.05$). The other variables whose coefficients were statistically insignificant included; the amount of sweet potatoes stored; availability of processed sweet potato in the market; quality of processed sweet potato; the price of locally processed sweet potato; the price of fresh sweet potato, household income; the total family size; the amount of sweet potatoes produced and the total household members have ($p > 0.05$) and hence they are not statistically significant.Correlation analysis shows that the coefficient of correlation between quantities of sweet potato value added products consumed in relation to the size of land owned is highly statistically significant ($p < 0.01$). Land had a positive sign and was significant at the 1% level. The expansion of household land use by 1% raised per capita income by 0.7%, which is largely as a result of increased agricultural production. The upshot of this finding is that rural income can be improved by expanding production activities to the unused or underutilised land (Aikaeli, 2010). Presumably however, increasing acreage could be more effective if complemented by improvements of inputs, such us mechanisation of agriculture.

Meanwhile the analysis shows that the number of years in school is statistically highly significant at 5%; and as hypothesised, its coefficient had a negative sign (Table 4). This implies that the lower the level of education of the household head, the lower the household per capita income. Indeed, if the education of the rural household head decreases by one level, per capita income will fall by approximately two-third.[4]The corollary of this finding is that education leads to proficient household management and, crucially, improves economic performance of the household as a whole.[5] In additional to agricultural activities, household with relatively higher education are more likely to have production skills and knowledge and hence can easily be engaged in income generating activities. Variables whose coefficients were statistically insignificant include the amount of sweet potatoes stored; availability of processed sweet potato in the market; quality of processed sweet potato; the price of locally processed sweet potato; the price of fresh sweet potatoes, household income; total family size; the amount of sweet potatoes produced and the total household members.

Cognizant, the cross tabulation between wards and age category of the sampled households. The data reveal that 38.7% of the sampled respondents aged between 40 – 50 years and 22% of the households were below 28.1 years of age. Hence, one can conclude that the age group between 29- 39 which is (28%), which is considered to be the most active working force was not much engaged in sweet potato production as compared to the 40 – 50 years age group.

[4] Statistically speaking, it would seem easy to increase education but, in practice, it requires sustained investments to increase both quantity and quality of education.

[5] Note that the type of education captured in the surveys is formal primary school education that can be somehow substantiated.

Table 4: Coefficient Correlation

Variable included	Coefficient	Standard error	T-ratio	Significance level	VIF	Tolerance
Total household members	0.248	59.506	0.755	0.466	4.389	0.228
Land owned(hectares)	**0.707****	113.184	3.180	0.009	2.010	0.498
Price of sweet potatoes processed (Kg)	-0.011	0.632	-0.059	0.954	1.348	0.742
Price of sweet potatoes fleshed (Kg)	-0.048	1.201	-0.262	0.798	1.381	0.724
Availability of Processed products in the Market (Dummy)	0.294	225.986	1.644	0.128	1.306	0.765
Quality as perceived by respondents (Dummy)	-0.203	278.927	-0.872	0.402	2.218	0.451
Average income(Tsh)	-0.308	0.002	-1.435	0.179	1.872	0.534
Education of respond (Number of years)	**-0.718***	278.848	-2.631	0.023	3.031	0.330
Amount of sweet potatoes produced (Kg)	0.412	0.287	0.862	-0.387	9.278	0.108
Amount of sweet potatoes stored (Kg)	0.248	0.288	-1.053	-0.256	10.135	0.099

Con	1728.98	0.495
Coefficient of Determination (R-Square)	**0.730****	
Adjusted R-Squared	**0.484***	
Standard Err of Est.	431.94	
Durbin Watson Statistic	2.232	
F-Value	2.970	

Dependent Variable: Amount of sweet potatoes consumed (Kg) per annum
Hence;

* Significant

** Highly

*** Very highly significant

4.3.2 Sweet potato production, value added produced and costs of production

The cost of sweet potato cultivation is high in other regions in the world as compared with that of other crops, but the return is also high (Elias *et al.* 1984b). However in Africa, average yields remain far too low for small-scale potato producers to produce marketable surpluses. Thus, sufficient quantities of quality seed are essential to meet the needs of potato growers, processors and traders. The data revealed that majority of respondents cultivates maize and sweet potatoes (DALDO, 2011) .Others cultivated paddy and groundnuts. Furthermore, data appealed that that the produce is not able to sustain even for consumption purposes to lift the farmer to the next harvesting season because consumption is higher than what harvested, hence it is common that majority of household becomes food insufficiency. The household with food insufficiency accustomed to labour out as a copping mechanism the situation that made them to become more vulnerable. However, poor and better-off farm households engage in off-farm commercial activities to reduce farming-related risks (Ellis and Mdoe 2002; Ellis and Freeman 2002). If research on sweet potato products is made more effective, perhaps sweet potato can be used to close the African food gap. In Tanzania, according to recent study the average yield of sweet potatoes in Tanzania is 6 metric tons per hectare (6000kg) ~ 75 bags on dry weight basis (Smith, 2004). Because of poor market linkages, inadequate information and poor infrastructure, decisions concerning prices of sweet potato products are decided by few players in the value chain. The middlemen, retail traders and end users of sweet potato products control the sweet potato market.

4.4 Price of the products

Prices of sweet potatoes differ from one node to another along the chain. This paper then analyzes the various independent variables which may explain this phenomenon. It is hypothesized that the correlation arises from systematic differences in the traits of households to utilize sweet potato value added products, rather than the prices. An interaction

of these independent variables with the quantity of sweet potato value added products consumed reveals that the consumption patterns react more strongly with certain independent variables. The characteristics that can be said to influence the pattern in the quantity of sweet potato value added products consumed include; the amount of sweet potatoes stored, availability of processed sweet potato in the market (Dominance of the products in the local shops and market places; quality of processed sweet potato (physical and chemical attributes as perceived by consumers in terms of flavor, smell, texture and appearance; the price of locally processed sweet potato; the price of flesh sweet potato; household income; education level attained by the respondents by number of years in school; the total family size of the respondents by number of family members; land size of the respondent in hectares; the amount of sweet potatoes produced and the total households members.

Analyses of the above factors hypothesized to influence the consumption of sweet potatoes were carried out using Multiple Regression analysis to see the correlations between them (variables). The goodness of fit of the model is measured using Coefficients of determination (R^2). The higher value of R^2 suggests that the variable included in the model explains about 73% of the variations in the dependent variable (Table 4). The F –Value is significant at ($P > 0.01$) probability level, indicating that the explanatory variables were statistically significant in explaining variation in the dependent variable (Gujarati, 1995).

Apart from household size, household income determines the purchasing power such that the higher the purchasing power the more the products purchased. (Note that this may not be the case for inferior good). Variations were observed in income levels among the sampled households in the study areas in terms of hectares cultivated because majority of respondents were farmers hence they have no other source of income. These variations may partly be due to the differences in the amount of disposable income received by the households from the main sources of households' income. As seen from Table 5, the mean income was Tsh 123 573.33 which is slightly lower compared to that of e per capita in the region which is 233 166 (URT, 2007b). Meanwhile, for Shinyanga region which ranks 17th in terms of per capita income among Tanzania Mainland regions its proportion of population below the national basic needs such as food, shelter and water is 35.7 % (URT, 2005). Hence more effort is needed to invest in improving food and income of the rural people.

Table 5. Average income

Variable	Range	Min	Max	Sum	Mean	Std.Deviation	Variance
Average income	790000	10000	800000	18536000	123573	1.05787E5	1.119E10

Source: Own survey, 2012

4.5 Main products derived from sweet potato in the study area

Table 6 below the data revealed that 82% of the surveyed consumers eat "*Michembe*" (the roots which are withered, cut into slices and dried) and this product can last up to 8 months without being infected (Gichuki *et al*., 2005). Moreover this product is simple in making and requires minimum cost in preparation as compared to "*Matobolwa*".

Table 6. Percentage distribution of the product derived from sweet potatoes

Products	Number	Percentage
Freshed Sweet potato	4	8.0
Matobolwa	5	10.0
Michembe	41	82.0
Total	50	100.0

Source: Own survey, 2012

4.6 Sources of product supply for consumers and retailers

The survey also sought to identify consumers and retailers sources of supply. The data in Table 7 show that 70% of consumers and traders buy the product directly from the local markets and 20% get the products from the producers /processors and of 10% of the sampled consumers buy the products from the exhibitions like "Nane Nane Show". Hence, processors need to join hand in order to capitalize the market of local made food products (URT and TAFSIP, 2011).

Table 7. Percentage distribution of the product derived from sweet potatoes

Various sources	Number	Percentage
Local market places	35	70.0
Exhibitions	5	10.0
Processors	10	20.0
Total	50	100.0

Source: Own survey, 2012

4.7 Consumers' preferences to sweet potato value products

Regarding consumers' preferences on the consumption of local processed foods, the results show that 34.7% of the sampled respondents (consumers) purchase sweet potato value added products due to its nutritional value. Meanwhile 31.3% reported that they purchase local made sweet potato products because of not having enough cash to by other processed imported products (Table 8).

Table 8. Percentage distribution of the consumers and factors that influence purchasing of agro-food products from sweet potatoes

Factors	**Number**	**Percentage**
Nutritional value	61	34.7
No cash to buy alternatives	55	31.3
Not aware on imported products	30	17.0
Saves during off season	30	17.0
	1 176*	100.0

Source: Own survey, 2012

**Multiple Responses*

4.8 Quality attributes of sweet potatoes value added products as perceived by consumers

The survey also sought to determine consumers' quality attributes for the sweet potatoes processed products. The results show that consumers are aware of the different quality attributes of processed sweet product such as taste, freshness, flavor, colour, texture, nutritional value, and shelf life, required for processed foods.

5. Conclusion and Recommendation

5.1 Conclusion

Sweet potato crop is important crop in Tanzania due to its suitability of the agro ecological and potential multiple uses. The potential of the crop is barred because of the following challenges; Negative perception as female crop; Most of the interviewed farmers perceived sweet potatoes as female crop because it does not command a place over maize or cotton in the market. As result many women use it for household food security when maize harvests fails; Biotic stresses (weevils and borers); the crop is prone to insecticide such as weevils and borers because many farmers use local varieties and poor agronomic practices; Poor post harvest, handling and processing; A biotic stresses (climate change, especially drought); Farmers are not well linked with market; Unstable prices; Limited infrastructure (No financial services);Unfavorable policies for tuber crops; disorganized subsector and limited private sector involvement.

5.2 Recommendation

- Sensitizations to promote sweet potato commercial farming
- Government to assist the formation of producers and marketing cooperative groups

Acknowledgements

I wish to express my sincere gratitude to Dr. Elibariki Msuya and Prof Melchior E. Mlambiti my Supervisors, whose valuable comments, guidance, constructive challenges and close supervision, made this work possible.Moreover, greatly acknowledge financial support by High Education Students Loan Board (HESLB) of the United Republic of Tanzania, the University Of Dodoma (UDOM) and the key actors in sweet potatoes value chain for their assistance.

Reference

Bashaasha, B. and Scott, G. 2001. Processed Sweet Potato In The Household Economy of North East Uganda. *Eastern Africa Journal of Rural Development*. 17(1):35-49.

Commonwealth Secretariat (2003).Gender Mainstreaming In Agriculture and Rural Development. A Reference Manual for Government and other Stakeholders.

District Agricultural Development Plans (DADPS). (2010). Shinyanga Rural District Agricultural Development Plan (DADPS), Shinyanga, Tanzania.

Elias, S.M., M.I. Hossain, N.I. Mondal and N. Islam. 1984b. *Sweet Potato Production In Bangladesh:Socio-Economic Assessment Of Improved Technology and Identification of Constraints To Its Higher Production*. Joydebpur: AED/BARI. Report No. 84-7.

Ellis, Frank and Ade H. Freeman (2002) '*Rural Livelihoods and Poverty reduction Strategies in Four African Countries*', LADDER Discussion Paper, Draft, October.

Ellis, Frank and Ntengua Mdoe (2002) *Livelihoods and Rural Poverty Reduction in Tanzania,* LADDER Working Paper No. 18, University of East Anglia, February.

Engoru, P., Mugisha, J., and Bashaasha B. (2005). A characterization of tuber utilisation among sweet potato producers in eastern Uganda. *African Crop Science Conference Proceedings*, 6, 726-731. Printed in Uganda.

Ewell, P. T. (2002). *Sweet Potato Production in Sub-Saharan Africa: Patterns and Key Issues*. Nairobi, Kenya: CIP.

FAO (1998). *My Talents, Many Women Feed The World*. United Nations, Rome Pp 3-7.

Food and Agricultural Organization (FAO) (2010). FAOSTAT. Food and Agriculture Organization, Rome, Italy [www.http://faostat.fao.org/default.aspx].Site visited on (30 /5/ 2011).

Food and Agricultural Organization (FAO) (2003). *Production Year Book vol.57*. FAO, Rome.

Food and Agricultural Organization (FAO). (2004). FAO *Statistics*. Food and Agriculture Organization, Rome, Italy [http:www.apps.fao.org] site visited on 30 /10/ 2010.

Food and Agricultural Organization (FAO). (2007). FAOSTAT Data. Food and Agriculture Organization, Rome.[http:www.faostat.external.fao.org/default.jsp] site visited on 25 /4/ 2010.

Gichuki, S., La Bonte, D., Burg ,K., Kapinga, R., and Simon, J.C.(2005).Assessment and Genetic Diversity ,Farmer Participatory Breeding and Sustainable Conservation of Eastern Africa Sweet Potato Germ-Plasm. Annual report April 2004 - March 2005.

Gujarati, D.N. (1995*).Basic Econometrics*. McGraw- Hill International editors New Delhi, India. 705pp.

Jehovaness.A. (2010). *Determinants of Rural Income in Tanzania*, An Empirical Approach. REPOA research reports. Dar-Es-Salaam: REPOA.

Jiggins, J. R.K. Samanta and J.E. Olawoye (1997). *Improving Women Farmers Access to Extension service In: Improving Agricultural Extension*; A Reference Manual (Swanson B.E. et al (Eds) FAO; Rome.

Kabuje, (2008).*Analysis of value chain for Hides and Skin in Arusha and Dodoma*, Tanzania Dissertation for MSc. Degree of Sokoine University of Agricultural. Morogoro Tanzania.123pp.

Ndunguru G. T. (2003). Handling of Sweet Potato During Marketing. In: *Cassava and Sweet Potato After Harvesting*. Editors: Ngazi, H., Joram F., Placid J.,Ngendello, T. and Van Oirschot, Q. Proceedings of a Workshop held at the Lake Zone Agricultural Research and Development Institute, Ukiriguru, Mwanza Tanzania, 29 April 2002.

Ndunguru, G. T. (2001). *Influence of Quality Attributes on the Market Value of Flesh Sweet Potato Tubers and Processed in Cassava Mwanza and Morogoro*, Dissertation for the Awards of PhD Degree at Sokoine University of Agriculture, Morogoro, Tanzania and Natural Resource Institute of Greenwich .155pp.

Smith, M. (2004). Born-Again Crops Give Hope to Zimbabwean Farmers [http://www.Zimbabwean+farmers:+Ian+Robertson] Site visited on 24/12/2011.

United Republic of Tanzania (URT) (2002b). *Mwanza Region Social-Economic Profile*. Joint publication by National Bureau of Statistics and Mwanza Regional Commissioner's Office, Coordinated by The President Office Planning and Privatization, Dar es Salaam. 233 -246.

United Republic of Tanzania (URT) (2003*b*). *Agricultural Sector Development Programme (ASDP): Framework and Process Document*, March, Dar – Es - Salaam.

United Republic of Tanzania (URT)(2005). *National Strategy for Growth and Reduction of Poverty*. Government Printer DSM, 4pp.

United Republic of Tanzania (URT) (2007). *Household Budget Survey*, Dar-Es-Salaam, Tanzania.

United Republic of Tanzania (URT) (2007). *Poverty and Human Development Report*. MKUKUTA Secretariat, Poverty Eradication Division, Ministry of Planning, Economy and Empowerment, Dar – Es - Salaam. 4pp.

United Republic of Tanzania (URT) (2007b). *Shinyanga Region Social-Economic Profile*. Joint publication by National Bureau of Statistics and Shinyanga Regional Commissioner's Office, Coordinated by The President Office Planning and Privatization, Dar-Es-Salaam. 28-284pp.

United Republic of Tanzania (URT) (2011). *Country Review Report*. Tanzania Agriculture Food Security Investment Plan (TAFSIP). Government Printer DSM, 12pp.