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Network Dimensions and Performance of Small-sized Food Processing enterprises in Dar es Salaam Tanzania: An Empirical Study

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Abstract

Food processing sector in developing countries as it is in Tanzania largely depend on networks. This is because businesses in context are often constrained by lack of enough financial and other physical resources. Although network literature is replete of its dimensions, small-sized firms' networks are not fully contextualized. This study examines network dimensions on performance of small-sized food processing enterprises in Dar es Salaam Tanzania. Investigation is done in two perspectives (i) network dimension defined by range and intensity of firms' level of involvement into particular network relationships is essential resource that foster business expansion, increase market size and guarantees new markets. (ii) The expansion process is further translated or measured as firm's performance. The research variables were innovatively developed based network dimension model and 'fine grained' from theoretical literature review whereby two hypotheses were generated and tested using p-values and a multivariate logistic regression model from 50 food processors. Findings reveal that firm's with intensive and many network relationships are comparatively performing better than those without. However, costs related to networks sometimes acted as bottleneck to performance. To lower the costs of networking, businesses had respective departments that liaise with business associations and the government. We recommend that the government should support business associations and where possible reduce bureaucracy in her communications with businesses.

Keywords: Network Dimensions, Performance, Small-sized food processors, Dar es Salaam, and Tanzania.

1. INTRODUCTION

Small and medium-sized businesses regularly operate in limited financial and managerial resources important for ensuring firm performance (Bengesi and Roux, 2014). They also often lack knowledge about markets, financiers, agents and other network partners. Consequently, they may make their business decisions slowly therefore their performances may not be as good as for large businesses. Important decisions like which market to enter, whether to internationalize or not, increasing new products, improving quality of products and expanding market share just to mention few performance indicators are extremely hampered by inability of SMEs to access resources. Therefore, decisions about the resources which SMEs utilize for certain level of performance are among the most pivotal for success and survival (Maina, Marwa and Waiguchu, 2016).

One important explanation of how SMEs overcome resource limitation is that they use relationships they have with other businesses (Agndal, Chetty and Wilson, 2008). For example, it is often asserted that for a business to successfully perform must acquire information about markets it intends to serve, gather resources to produce the products and have appropriate strategies on hand (Bengesi and Roux, 2014). Networks may then be utilized to achieve targeted level of performance such as internationalization, increasing market shares or convincing new customers. A firm can therefore learn from other businesses in a network and improve its performance.

A firm's network relationships and resources can be grouped into many dimensions such as the relational dimensions and structural dimensions (Tedla, 2015). Olomi (2009) categorised network based on range and intensity into two: vertical network and horizontal network. Vertical network also termed as marketing channel networks is formed for the objective of solving for example like: marketing problems with buyers, suppliers, producers. Horizontal network is formed between similar enterprises located in a given geographical area operating in a given sector (competing firms) for co-operation purposes (e.g. joint purchase of raw materials). FAO (2008) have shown that small processors serve as a catalyst which stimulates rural development from dimensions such as health, education, development of infrastructure (roads, electricity and water) thereby helping to reduce the rural–urban income disparity. Small processors also enhance the viability of small-scale farms by providing market outlet for their products, often within the vicinity of rural areas.

Network range and intensity can both be affected and affect business performance depending on the number of relationships a firm has and the level of involvement into such network (Agndal *et al* 2008). This happens because firms have options to deepen into the existing relationships, form new ones and terminate those found to have problems (Bengesi and Roux 2014). For SMEs, this implies that the range and intensity of networks impact business performance in different ways. For example, certain type of network like horizontal one may be necessary for sales performance in the domestic markets while vertical integrations and joint ventures are necessary for internationalizing firms (Maina, *et, al.,* 2016). While the concept of network dimensions is often implied in the business performance literature, it is should be highlighted that the influence of network range and intensity on business performance has received limited research attention (Coviello, 2006). Consequently, there is limited knowledge on influence of the network dimensions on business performance.

This study investigates the impact of network range and intensity on SMEs performance. To our knowledge, few – if any – studies have studied network range and intensity on business performance of SMEs in a developing country context. We focus of food processing SMEs in Dar es Salaam, Tanzania because it is an area where most SMEs of the country are located.

SMEs in this sector are also capital intensive however due to inherently financial limitations in the country, networks are apparently necessary.

2.LITERATURE REVIEW

2.1 Concept of Networking

Chipika and Wilson (2006) defined networking as a set of sustained relationships which entail cooperation and collaboration and are mutually beneficial to all the parties involved in the network. It is a set of stable links established for cost effective economic transactions among the network members founded on formal and informal links with mutual goals (Scalera and Zazzaro, 2009). Conway *et al* (2006) identified four components for networking this are: actors, links, flows and mechanisms. *The* actors are individuals (*human beings, computers, places and organization*) that make up the network. *The* links are arches that connect individuals. The flows indicate the exchanges (*flows of information, advice, money, goods, power, and friendship*) that occur between actors within the network. The mechanisms of the network are the modes interaction (*face-to-face interactions, meetings, planning, and joint participation like in trade fairs or business seminars*) employed by the actors within the networks.

Networking has long been linked with sharing resources among business partners, access to market and new technologies that small firm could not be able to access in isolation and size disadvantaged. The benefits of networking rely on trust and confidence among networking partners which are very important in sharing strategic resources. Such a relationship can be set up when a firm has relational skills to institute and sustain favourable exchange of strategic resources, ability to identify potential partners with relevant resources to complement resource needs and coordinate attained resources for the firm's advantage (Bengesi and Le Roux, 2014). In this view, it can argued that networking is indispensable for firms to build trust and confidence among business partners to allow exchange of strategic resources that consequently promote firms performance.

2.2 Type of Networking

The definition of networking can be broken down into the three (3) main types. This allows for a discussion of the three main types of networks (social networks, general networks and managerial) and how they are linked to one another.

2.2.1 General Business Networks

Moeller (2010) defines business network as voluntary inter-business cooperation between at least three enterprises whose entrepreneurial autonomy is partially limited by their cooperation. Xu, Lin and Lin (2008) views business networks as a set of two or more connected relationships in which each exchange relation is between business enterprises that are regarded as collective actors in the network. Besser, Miller, Korsching, and Welch (2006) described business networks as formal linkages composed primarily of business owners or managers established to facilitate the success of their respective enterprises. From all these definitions it can be noted that business networks add value to and increase the performance of an enterprise. Thus, enterprises form business relations to gain value central to business networks are trust and commitment (Moeller, 2010).

2.2.2 Managerial Networks

Managerial networks involve networking with suppliers, customers and with similar enterprises. Managerial networks involve links between the manager of a firm and the managers of other firms. Managerial networking between a firm's manager and the other top managers of other firms presents opportunities for information acquisition is essential. These

managerial ties have pivotal influences on firm activities, provide a source of competitive advantages, enable the superior performance of the firm and help in increasing the legitimacy of firms (Ngoc and Nguyen, 2009). Managerial networks of firm owners may improve the sharing of information and contacts (Khwaja, Asim Ijaz, Atif Mian, and Abid Qamar, 2011), access to bank loans from the banks, more clients, business associates, suppliers, and technical and market knowledge (Farinda, Kamarulzaman, Abdullah and Ahmad, 2009) and gain managerial skills (Hicklin, O'Toole and Meier, 2006). This mutual support from firms and managers in the same managerial networks may lead to better performance of the firms (Thrikalawa, 2011). However, Hicklin *et al* (2006) proposed that too much investment in managerial networks will result in diminishing returns in terms of performance.

2.2.3 Social Networks

Hung (2006) defined social networks as linkages or social systems of individual(s) that facilitate access to resources or valued sources of information that are beneficial to business enterprises. Lea, Yu, Maguluru and Nichols (2006) considered social networks as set of people who are connected by socially meaningful relationships, such as friendship, co-working and information exchange to achieve mutual goals. Krebs (2008) posits that the essence of social capital entails that it is not what individuals can do that provides competitive advantage. This view corroborates with Laibanca and Brass (2006) who argued that in business enterprises, employees' and manager's social contacts convey benefits that create opportunities for their enterprises which lead to competitive advantages.

2.3 Overview of Micro, Small and Medium Enterprises

There have been many efforts to define MSEs. At present, there is no universally acceptable definition (Scarborough, Wilson and Zimmerer, 2009; Olomi, 2005; Khan, 2010). The definitions use various measures of sizes depending on the purpose and the person doing the measuring (Tambwe, 2015). Commonly used yardsticks include quantitative measures such as total number of employees, total investments, and sales turnover (Olomi, 2009). The definition also varies from country to country and from industry to industry depending on criteria such as the number of workers employed, volume of output or sales, value of assets employed, and the use of energy (Das, Shil, and Pramanik, 2007).

European Union defines a micro enterprise has a headcount of less than 10, and a turnover or balance sheet total of not more than €2 million. A small firm has a headcount of less than 50, and a turnover or balance sheet total of not more than € 10 million (EC, 2006). In USA a small enterprise is defined as an entity with average annual gross revenues for the preceding three years not to exceed $15 million, and very small enterprises (Micro enterprises) as an entity with average annual gross revenues for the preceding three years not to exceed $3 million (Aynadis & Mohammednur, 2014). Australian Bureau of Statistics defined small businesses to include sole proprietorships and partnerships. Businesses employing fewer than five (5) people are defined as micro-businesses and other businesses employing five or more people but less than 20 people as small ones, while medium-sized businesses are those employing fewer than 200 people (Zeinalnezhad *et al*., 2011).

In Tanzania micro enterprises are those with one (1) to four (4) employees and a capital up to Tshs. 5 million, while small enterprises have employee between 5 and 49 and a capital investment ranging between Tshs.5 million to Tshs.200 million (UNIDO, 2012b; URT, 2012). From this definition majority of these enterprises fall under the informal sector, mainly performing activities such as trading, manufacturing, agriculture, mining, and services. They contribute to 27% of GDP, 23.4% of the total employment (URT, 2012) where every year more than 850,000 people enter the labour market and many of them are absorbed by this sector

(UNIDO, 2012a). This indicates how important the sector is in employment creation and economic development.

Table 1 : Tanzania Definition of MSMEs

Category	Capital investment (Tshs)	Number of Employees
Micro Enterprise	Up to 5 million	1 – 4
Small Enterprise	5 – 200 million	5 – 49
Medium Enterprise	200 - 800 million	50 – 99

** 1US$ = Tshs. 2,279.70/= BOT May 10th, 2018*

Source: SMEs Development Policy of 2003

2.1.6 Networking and MSMEs

Scarcity of resources is one of the main problems of SMEs (UNIDO cited in Zeinalnezhad *et al*, 2011). SMEs can solve problems with regard to economies of scale and scope imposed by their size-disadvantaged by being linked into national, regional and global networks of firms and value chains. Networked firms may enjoy higher growth rates and superior performance. Networks also affect firm's strategic choices and performance (Batjargal and Liu cited in Hossein *et al*., 2011). Networking significantly positively associated with firm survival. Formal and informal network are associated with firm survival, but that only formal networks are associated with growth (Watson, cited in Hossein *et al*., 2011).

Networks account for differences between SMEs with regard to their likelihood to succeed. Networks explain why SMEs are likely to upgrade in a particular country (Loewe *et al*., 2013). Networking has a positive impact on the SMEs performance and increased legitimacy that in turn influences access to external finance and tapping of resources in an external environment successfully (Olawale and Gware, 2010). Networking helps SMEs to access markets information, finance advice or support, and official documents that are usually not easily accessible. This according to Thrikalawa (2011) may lead to better firm performance.

2.1.5 Theoretical Review

There are three major theories in the firm's networking literature: Resource Dependency Theory (RDT), Transaction Cost Theory (TCT) and Social Network Theory (SNT). RDT argues that firms enter in network of relationship in order to gain access to scarce resources. Unlike the RDT, TCT describes that collaboration among firms is undertaken for the aim of minimizing transaction cost in doing different marketing activities. SNT emphasizes the importance of trust, commitment in investing resources and times for the network are crucial for the successful relationship within network (Sahakijicharn, 2007; Casals, 2011). This study therefore adopts the Resource Dependency Theory (RDT).

The major tenet of Resource Dependency Theory (RDT) is resource scarcity, resulting in multiple organizations competing for the same or similar sets of scarce resources. Firm's survival depends on their ability to acquire and retain resources from other actors in the immediate task environment (Hessels & Terjesen, 2010). RDT also considers a firm's ability to acquire resources needed for exporting (Mwiti, Ofafa, & Mkimu, 2013). One of the key resources that these firms require from the home market is networking necessary for their performance locally or internationally.

Small-sized food processing enterprises are constrained with resources, particularly when compared with medium, large, and multinational enterprises. They are predominantly reliant on the resources considered to be available in their home market. Network linkages provided by the governments in the domestic market with the aim of boosting their performance are

among the key confined resources among food processing enterprises. Building on RDT, Small-sized food processing enterprises depend on the level of production costs in the home market environment.

When network resources are widely available and easily accessible in the home market, Small-sized food processing enterprises may be more likely to compete in the markets easily. When production costs are perceived to be favourable, Small-sized food processing enterprises may be able to develop better competitive products and services. Thus, Small-sized food processing enterprises with access to network resources may have an adequate context for developing such competitive products. This study adopted two major forms of networking i.e. network range and network intensity. From this position hypothesis H_{A1}– H_{A2} are formulated:

> ***H_{A1}:*** *There is a relationship between network range and performance of Small-sized food processing enterprises in Dar es Salaam Tanzania.*
>
> ***H_{A2}:*** *There exists a relationship between network intensity and performance of Small-sized food processing enterprises in Dar es Salaam Tanzania.*

2.2 Empirical Literature Review

Tooksoon and Mudor (2012) studied the relationship between networking resources and export performance among SMEs in Thai exporting the agro based sector. The study findings showed that business network was statistically significant and positively associated with export success and export penetrations. While institutional network was also statistically significant but shows a negative association with export performance. Yet knowledge network was not associated with both dimensions of export performance.

Behyan (2011) did a study on conceptualizing export performance influences of internationalizing and Social Network. The study found that social network and foreign partnership had positive effect on the internationalization process, knowledge of foreign market opportunities, international experience and international knowledge. The relationship between social network and export performance had positive effect on the export performance and its indicators such as sales growth, profit growth and so on. But, the study did not tell us the impact of formal networking relationship (domestic supporting institutions for SMEs) on the performance of SMEs. it was focused only studying the impact of foreign partnership and interpersonal relationship on the performance of SMEs.

Hassan and McCarthy (2011) investigated Influential capabilities for SMEs export performance, they found that the capability to develop business networking, innovation capabilities and capability to meet export standard were crucial for Malaysians SMEs export performance. The SMEs need to focus on developing their business networking in order to enhance both their innovation capabilities and their capability to meet export standards which in turn leads to export performance improvement. The research followed a qualitative research approach by interviewing 23 managers of SMEs. The research design used in the study was exploratory in nature and the data was collected through in depth interview with CEOs and employees. Since qualitative method of analysis used in the study it difficult to confirm the reliability and validity of the result of the study statistically.

Ge *et al* (2009) studied the impact of networking and resource acquisition on the performance of SMEs in China. A total of 227 firms were surveyed through personal interview and questionnaires designed on a five point Likert scale. Descriptive statistics, correlation and structural equation modeling were used in the analysis. Findings indicated that that networking intensity was positively related with resource acquisition capability and resource acquisition outcome. The study established a positive relationship between networking range and resource

acquisitions capability and resource acquisition outcome. Resource acquisition capability and resource acquisition outcome were also positively related with firm performance.

Trulsson (1997) was interested in understanding industrial entrepreneurship and structural change in North-west Tanzania. It was found that networks are not crucial for entrepreneurs but dyads are (one to one relations). Murphy (2001) examined the social factors related to small and large scale manufacturing firms in Tanzania. It was found that networks facilitate innovation when they are structurally dense and spatially extended and when participating business people are willing to create strong bonds in their local communities. Nnunduma (2003) conducted a qualitative study on the structure and behaviour of food trading networks in Tanzania and observed that reciprocity, durability, and reachability were key attributes of strength of ties. Swabir (2002) studied the social relationships and networks on the growth of SMEs in Tanzania and found that networking had assisted in terms of business information, finance, physical assets and moral support. Rutashobya and Jaensson (2004) in their study on the role of networks in internationalization of small firms in Tanzania, found that many owner/managers belonged to at least more than one network relationship. A study by Kristiansen *et al* (2005) dealt with information flow and adaptation in Tanzanian cottage industries indicate that social networking was a dominant contributor in accessing market information. Rutashobya *et al* carried out an exploratory study on the networks, relationships and performance of SMEs in the shipping sub-sector in Tanzania reveal that not all firms use networking as a strategy.

2.3 Research Gaps

Several studies have been done on networking and enterprises' performance, including Ge *et al*, (2009), Hassan and McCarthy (2011), Behyan (2011), Tooksoon and Mudor (2012), Behyan (2011), Tooksoon and Mudor (2012). These studies exposed networking and enterprise performance issues, yet they did not involve performance of small-sized food processing enterprises, and neither did they include Tanzania. In addition to these, the study did not tell us which type of networking resources had positive or negative impact on enterprise performance. There is also seemingly evidence of lack of viable network approaches and strategies which seek to identify and serve specific and unmet needs of small-sized food processing enterprises operators by network providers. Thus, it is obvious that there is a deficiency of local studies on this observable fact. Based on this background, this study, therefore intended to fill theses pertinent gaps in literature on network dimension with a specific focus on network intensity and network range.

2.4 Conceptual Framework

In this study, the dependent variable is the performance of small-sized food processing enterprises. The independent variables (network intensity and network range) are specific factors which lead to either progress or regression of firm performance. Access to networking by the small-sized food processing enterprises will reflect their overall export performance, either positively or negatively. The association between variables of the study is clearly illustrated in the schematic diagram in Figure 1 forming the conceptual framework for this study.

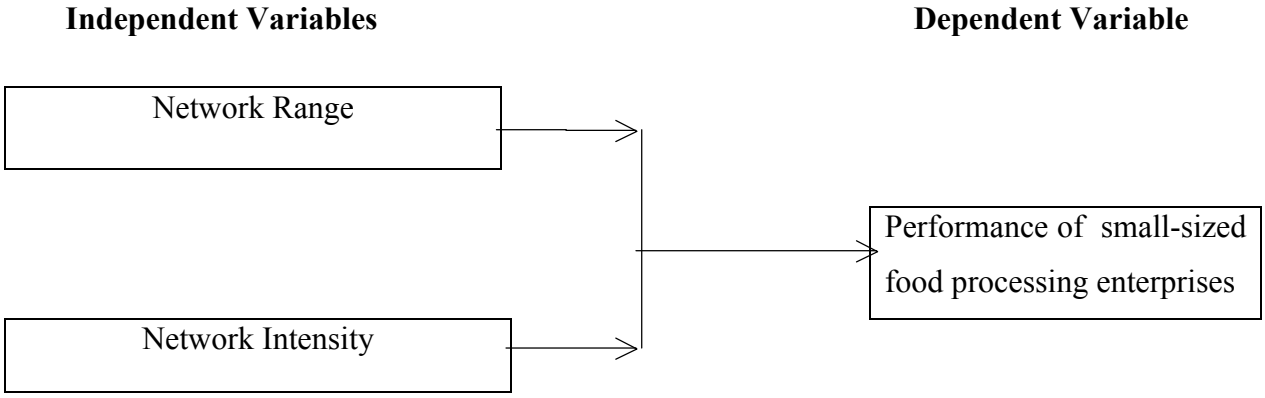

Figure 1 : Conceptual Framework.

3. METHODOLOGY

The research design of this study was a case study. The study was conducted in Dar es Salaam Tanzania. The study consisted of 50 small-sized food processing enterprises obtained by using purposive sampling and snowball sampling techniques. Data were carefully collected through questionnaire with questions focused on network dimensions and performance of small scale food processors. A five-point Likert scale was used where respondents were asked to rate their opinions. The scale ranged from "strongly agree" to "strongly disagree."

The study also used Pearson correlation coefficient (r) to establish the strength of the relationship between network range, network intensity and performance of small-sized food processing enterprises. A multivariate logistic regression was also used to model the relationship between the independent variables (network intensity and network range) and performance of food processing enterprises. The developed equation was:

$$\textbf{Logit } [p(x)] = \log [p(x)/1\text{-}p(x)] = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \varepsilon_o$$

Where:

Logit (P_i) = Performance of small scale food processors (measured by Profitability, Sales growth and Customer base)

β_o - β_1 = Coefficients of the model

X_1 = Network range (Relationship with suppliers, government research institutes, Business Development Services Providers BDSPs)

X_2 = Network intensity (Intimacy levels and Meeting frequency)

e_i = Error term

The overall significance of the model was assessed by using Omnibus tests of model coefficients which shows the relationship between the dependent and independent variable. The Cox and Snell R Square and the Nagelkerke R square value, were used to measure the amount of variation in the dependent variable as predicted by the variation in the independent variables. The study also used Hosmer-Lemeshow test to determine the good fit of the model. Two hypotheses were developed and tested by using P-value and t-statistic at 5 per cent level of significance. Appropriate alphas were used for assessment at the different significance levels. If p-value is less than 0.05 we accept the alternative hypothesis, otherwise we reject it (Cooper, Schindler, and Sharma, 2012).

4.RESULTS AND DISCUSSION

4.1 Demographic Characteristics of Respondents.

4.1.1 Age of Respondents

It was of interest knowing age differences as age brings along experiences, responsibilities and skills (Bass, 2005). The study findings in figure 2 revealed that among 40% were the age of 45 to 70 years old, 34% aged 25 to 35 years old, 26% were the age of 36 years old to 45 years old. This implies that the majority of respondents were between 45 to 70 ages while small number of respondents belonged to 36 to 45 ages. This suggests that there is high proportion of adults who mainly participate in food processing industry.

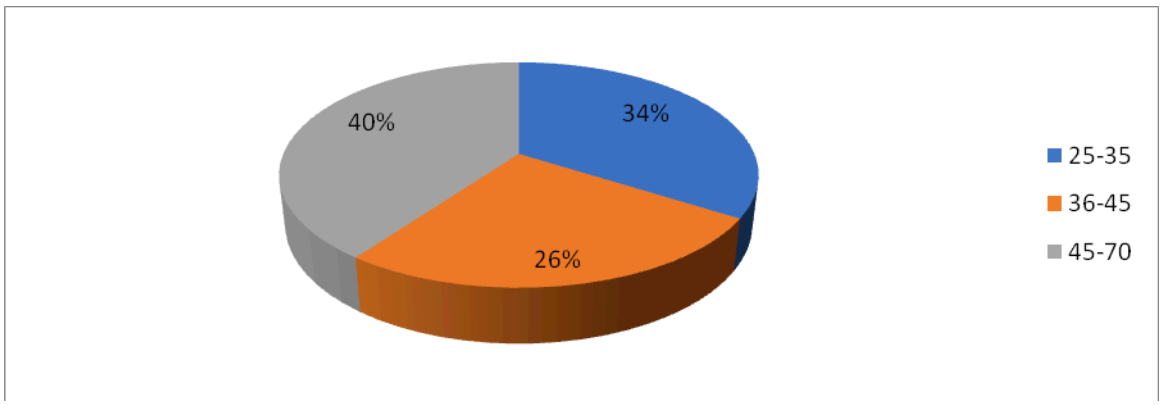

Figure 2 : Respondent's Age

4.1.2 Gender of the Respondents

Results in figure 3 shows that female owned small-sized food processing enterprises outnumbered those owned by males by 72% to 28% thus 44% difference. This is in line with (Kazungu, Ngugi, Rotich and Odhiambo, 2018; Mori, 2014) who indicated that more women are involved in owning and running SEs. The domination of women in this industry is due to the introduction of new simple technologies, nature of tasks, special cultural characteristics, society's social and economic changes (Almamari, 2015).

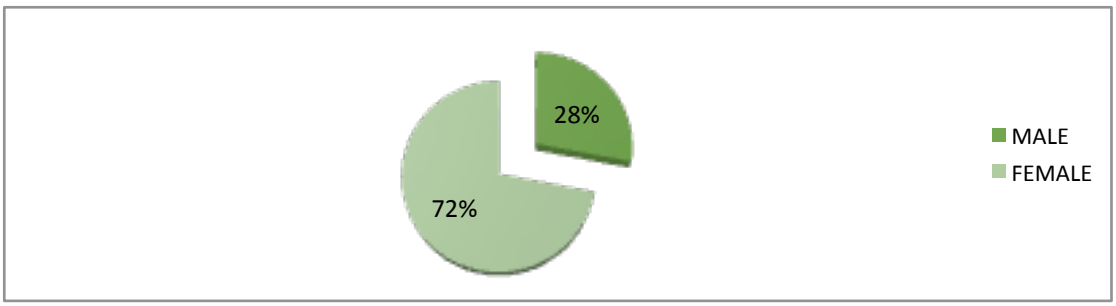

Figure 3 : Gender of respondents

4.1.3 Education level of the Respondents

The study also evaluated the respondents educational level. Findings in figure 4 revealed that 42% had secondary education, 38% primary school education, and 20% had College/University education. It is very important to look at entrepreneurs' levels of academic qualifications as they influence the impartation of both managerial and entrepreneurial skills of most entrepreneurs

(Ngugi, 2008). The performance of MSEs in Tanzania can thus be attributed by the level of education of the entrepreneurs as it was observed that 62% of the entrepreneurs in this industry have above basic education which is primary school level in Tanzanian context. This corroborates with Xiaowei and Zhang (2010) who found that owner education level had a positive effect on firm operation and performance.

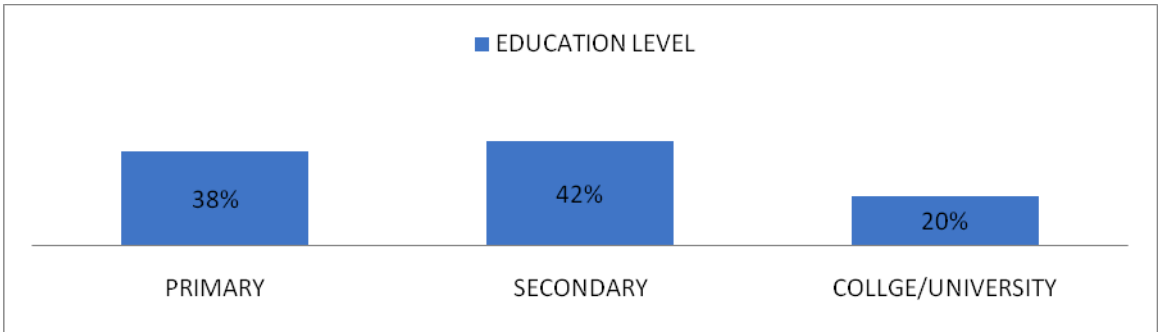

Figure 4 : Education level of the respondents

4.2 Network Intensity

On the aspect of intensity, results in table 2 established that most of food processors (54%) agreed on working closely with their customers (Mean=3.48). The study further revealed that most of the food processors maintained good relationships with other actors in the business environment, it was noted that most of the food processors working closely with suppliers (Mean=2.96), maintained good relationships with their competitors by 34% and (Mean=2.84) and agreed on receiving feedback from their customers by 58% with the mean of 4.14 as catalysts for networking. Also it was noted that most of the food processors were not working with the research institutes (42% strongly Disagree) also 62% were disagreed on working closely with BDSPs and 58%were strongly disagreed on enjoying the government incentives and support. This findings are consistent with the assertion of Ahuja (2000) who noted that the closer the relationship among members, the faster the speed of sharing. This observation supports the findings by Seck and Mazzarol (2006) who found that network intensity is a predictor of firm's performance. Further, this study findings support Lagat (2016) who found that network intensity had an effect on supply chain performance.

Table 2: Descriptive Analysis of Network Intensity

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	MEAN	SD
We work closely with our customers?	04%	22%	08%	54%	12%	3.4800	1.09246
We work closely with our suppliers?	28%	04%	22%	36%	10%	2.9600	1.39913
We work with research institutes	42%	26%	22%	10%	0%	2.4000	0.94761
We work closely with BDSPs?	08%	62%	26%	04%	0%	2.2600	0.66425
We have good relationship with our	10%	26%	34%	30%	0%	2.8400	0.97646

competitors							
We enjoy government incentives & support	58%	20%	04%	12%	06%	1.8800	1.28793
We receive feedback from our customers	02%	0%	10%	58%	30%	4.1400	0.75620

4.3 Network range

Results in Table 3 on network range revealed that most of the food processors maintained good relationships with each other in the business environment 58% agree working closely with their customers (Mean=4.02). Further, it was established that majority of them 42% agree maintain close relationship with each other (Mean =3.68), it was noted that most of them 28% (Mean=3.28) meet frequently. Most of respondents accounting to 46% indicated they had agreed to know each with (Mean=3.7400.). Finally it was established that 34% of respondent agreed to have trade associates. This study supports Ge, Hisrich and Dong (2004) who found positive association between network range and firm performance, it is evident that most respondents maintain close relationship with customers and hence they receive feedback from them.

Table 3 : Descriptive Analysis of Network Range

Statement	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**MEAN**	**SD**
Have good relationship with each other?	02%	0%	16%	58%	24%	4.0200	0.76904
Keep close relationship with each other?	06%	10%	18%	42%	24%	3.6800	1.13281
Meet regularly with each other?	06%	24%	24%	28%	18%	3.2800	1.19591
Know each other?	0%	12%	22%	46%	20%	3.7400	0.92162
Have trade associates?	16%	16%	04%	34%	30%	2.9000	1.12938

4.4 Correlations of the Study Variables

This study used Pearson product-moment correlation coefficient (r) to determine the strength of linear relationship between the independent variables and the dependent variable. Table 4 indicated the highest correlation was between performance of small-sized food processing enterprises and network range ($r = 0.807$, $p< 0.01$) signifying that network range had a strong positive correlation with the performance of small scale food processing enterprises. Results also showed that network range had a strong positive correlation with performance of small-sized food processing enterprises($r = 0. 616$ $p < 0.01$); with network range and network intensity having a positive correlation ($r = 0.736$ $p < 0.01$). In this study, the variables varied from -1 to +1

indicated that the variables were sufficiently different measures of separate variables. Therefore, all the variables were retained in the study.

Table 4: Correlations Matrix for the study variables

		Network Intensity	Network Range	Performance
Network Intensity	Pearson Correlation	1	.736**	.616**
	Sig. (2-tailed)		.002	.000
	N	50	50	50
Network Range	Pearson Correlation	.736**	1	.807
	Sig. (2-tailed)	.002		.000
	N	50	50	50
Performance	Pearson Correlation	.616**	.807	1
	Sig. (2-tailed)	.000	.000	
	N	50	50	50

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

4.5 Multivariate Logistic Regression Analysis for Performance of food processing enterprises

A multivariate logistic regression was used to model the relationship between the independent variables (network intensity and network range) and performance of food processing enterprises. In this study, the multivariate logistic regression model took the following equation:

Logit [p(x)] = log [p(x)/1-p(x)] = $\beta_o + \beta_1 X_1 + \beta_2 X_2 + \varepsilon_o$... Equation (1)

The multivariate logistic regression involves fitting an equation of the following form to the data:

Logit (p_i) = $\beta_o + \beta_1 X_1 + \beta_2 X_2 + \varepsilon_o$ ..... Equation (2)

Where:

Logit (p_i) = Y = Odds of performance of food processing enterprises (i.e. the probability that the firm performs well or otherwise, coded as 1 or 0)

β_i {i=1,2,3,4,5} = The coefficients for the various independent variables

Xi for; X_1 = Vector of network intensity

X_2 = Vector of network range

Table 5 shows that network intensity is statistically associated with performance of food processing enterprises (p<0.000). This means a unit increase in network intensity increases the probability of high performance by 5.805 times. This reflects the fact that the more the network intensity the higher the chances of performing well. Results in Table 5 also confirm that network range is statistically associated with performance of food processing enterprises (p<0.003). That is an increase network range increases the probability of having high performance of food processing enterprises by 10.273 times. Thus firms accessing network range have higher chances of performing better than those without.

Table 5: Multivariate Logistic Regression Analysis for Performance of food processing enterprises

Variable	β	S.E.	Wald	df.	Sig.	Exp(β)	95% C.I. for Exp(B)	
							Lower	Upper
Network Intensity (NI)	1.759	.454	14.997	1	.000	5.805	2.384	14.138
Network Range (NR)	2.330	.798	8.532	1	.003	10.273	2.152	49.038
Constant	1.851	1.088	2.896	1	.089	.157		

Omnibus test of Model Coefficients (Chi-square = 37.724; Sig 0.000)

Log likelihood = 14.262[b]; Cox & Snell R Square = 0.198; Nagelkerke R Square = 0.755

Hosmer and Lemeshow Test (Chi-square = 0.209; Sig 0.901)

Dependent variable: Performance of food processing enterprises (Perf_FPEs) = Binary: Y = if performing well , Y = 0 if not performing well

Using the values in Table 5, the multivariate logistic regression equation can be reported as follows:

Perf_FPEs = 1.851+ 1.759 NI + 2.330 NR.....Equation (3)

Overall test of relationship

Model fitting information in table 10 illustrates the relationship between the dependent and independent variables and divulge that probability of the model chi-square 37.724 was 0.000, less than the level of significance of 0.05 (i.e. $p < 0.05$). Thus the overall relationship between the variables of this study is significant.

Strength of binary logistic regression relationship

The study also intended to establish the strength of the binary logistic regression relationship, by using correlation measure (Pseudo R square measures, such as the Cox and Snell R Square and the Nagelkerke R square values), which provide a sign of the amount of variation in the dependent variable. Results in table 5 , Cox and Snell R and Nagelkerke R square values are 0.198 and 0.755 respectively, this gives a suggestion that 19.8% to 75.5% of the variability (in performance) is explained by the variables used in the model (network range and network intensity). The Wald test also shows that the independent variable is statistically significant. Findings in table 5 shows that network intensity had an Odds Ratio (OR) = 5.805 (95% CI 2.384 to 14.138), p = 0.000, than Network range which was found to have an Odds Ratio (OR) = 10.273 (95% CI 2.152 to 49.038), p = 0.003. This implies that while a unit change in network intensity increases the performance by 5.805 units, one unit raise in network intensity increases the performance by 10.273 units.

Hosmer and Lemeshow Test

This study used the Hosmer and Lemeshow test to measure how the performance of food processing enterprises is connected with access to network intensity and network range. In this test, for a good fit of the model p-value must be greater than 0.05 (Mangasini, 2014, Mendes & Ganga, 2013; Hosmer & Lemeshow, 2000). Findings in table 5 indicate a p-value of 0.901 on the Hosmer and Lemeshow test. This suggests the presence of a good fit of the model with a

positive and significant relationship between the predictor variables and the log of the odds of the criterion variable (p-value > 0.05).

Hypothesis testing

From Table 5, the model produced a positive and significant relationship between network intensity and performance of food processing enterprise in Dar es Salaam (ß = 1.759, t = 3.8744, p = 0.000). H_{A1} is therefore accepted, and it was concluded that there is a positive significant relationship between network intensity and performance of food processing enterprise in Dar es Salaam. Findings in table 5 further suggests a positive and significant relationship between network range and performance of food processing enterprise in Dar es Salaam (ß = 2.330, t = 2.9198, p = 0.000). H_A is therefore supported, and it was concluded that there is a positive significant relationship between network range and performance of food processing enterprise in Dar es Salaam. These findings corroborate with those of Cisi, Devicienti, Manello and Vannoni (2016), Kumburu (2016), Surin and Wahab (2013), and Gronum (2015) who observed a positive and significant link between networking and SMEs performances.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Findings of this study were able to establish that both network intensity and range play an important role in performance of small-sized food processing enterprises. The study results not only enrich literature on small scale enterprises and food processing industry in relation to networking but also have indicated specifically that network dimensions (network intensity and range) influences their performance. The study statistically concludes that network dimensions significant effect on the performance of small-sized food processing enterprises. Firms with well established inter-firm linkages can be sure that they can achieve superior performance. From descriptive statistics it was observed that well established network ties have a strong impact on performance. It was therefore concluded that there is positive significant relationship between network dimensions (network intensity and range) and performance of small-sized food processing enterprises

5.2 Recommendations

The study recommends for new policies and programmes which will come up with strategies which will promote networking among the operators of f small-sized food processing enterprises. It is also recommended that small sized enterprises need to establish mechanisms that will enable them to work closely and establish strong network ties with BDSPs, research institutes and trade associations. The government through the ministry of trade is also recommended to make a need assessment and establish as small-sized enterprises scheme that will be charged with the provision of incentives and support to industries of this nature and size.

5.3 Contribution of the Study to the Existing Knowledge

The study examined the influence of network dimensions on performance of small-sized food processing enterprises in Dar es Salaam Tanzania. The outcome was that networking has a significant influence on performance of small-sized food processing enterprises. Entrepreneur owners or managers in these firms should therefore invest in accessing vital network resources for venture performance enhancement. Further studies can also be undertaken linking business networks and performance of small-sized enterprises operating in other industries.

5.4 Areas for further Research

This study considered network dimensions among small-sized food processing enterprises. A replica of this study can be carried out with a further scope to include other sectors and industries with dominance of small-scale enterprises like the agro processing and handicrafts. Another study can investigate how industry life cycles affect firm networking. Future studies should apply different research instruments like interviews and focus group discussions to engage respondents more in discussions so as to generate detailed information which would help in bringing out the best network strategies for enhanced entrepreneurship development in Tanzania.

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