

Overcoming the Constraints of Finance in Micro and Small Enterprises: Lessons from Nigeria's Otigba Hardware Cluster

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Abstract

The study outlined how the microenterprises overcame the barrier of capital and credit through 'open development' characterised by collective sharing of knowledge, tools, equipment and workforce amongst competing microenterprises. Also by belonging to trade/professional associations which ensured that knowledge becomes a public good that can be accessed by everyone who needs it. The study also found out that majority of the microenterprises scaled-up within few months to around three years from inception, while only a few scaled up only after three years. Scaling-up of microbusinesses was captured with four proxy variables: increase in number of employees, increase access to capital, increase in gross earnings and increase in gross sales. The study concluded that clustering of small businesses in Africa could be a potential avenue to overcoming the popular financial constraints and an enabler of firm growth.

Keywords: Constraint, Finance, Microenterprises, Clustering and Scaling-up

Background to the Study

Industrialization can be seen as the process by which an economy moves away from small-scale artisanal production to large-scale machinery-based production. The process of industrialisation involves the extensive re-organisation of the economy for the purpose of manufacturing (O'Sullivan *et al.*, 2003). Tregenna (2015) defines structural change as changes in sectoral composition of output and employment contributing to higher economic growth and increased utilisation of underutilised resources, especially labour. Tregenna in her article thus associated structural change with shifting labour and capital to higher-productivity (Tregenna, 2015).

Within the economy, entrepreneurs are active drivers of industrialisation. Entrepreneurs create new firms, offering new products and introducing new processes, a term referred to as creative destruction by Joseph Schumpeter in 1934. On another note, entrepreneurs also run

their business through agglomeration and economies of scale, a term referred to as creative accumulation by Joseph Schumpeter in 1942. It is widely accepted that large firms significantly practice division of labour which helps them in promoting skills specialisation and improve their efficiency. There is also body of literature that supports the notion that the clustering of competent, highly specialized large firms lead to global value chains and localization economies (Malmberg & Maskell 2002; Henderson, 2003; Mander, 2014). Localization economies help to promote knowledge exchange, knowledge spill overs and technology transfers by encouraging innovation and rapid industrialisation which is most needed in Africa. Industrialization can be seen as the outcome of the activities of entrepreneurs (Mander, 2014).

Entrepreneurs have been known to play vital roles in developing and transition economies (Brasil, India, China and South Africa) because they played crucial role in structural transformation from low tech based labour intensive economies to high technology, knowledge based economies through adoption, assimilation and adaptation of foreign technologies from developed countries (Etzkowitz *et al.*, 2015). Thus, the entrepreneur is the indispensable machinery for knowledge creation and knowledge diffusion (Braunerhjelm, Ács, and Audretsch 2010).

As important as these entrepreneurs are, they are faced with a lot of challenges and most times their effort do not materialise in the desired output. This is because these entrepreneurs operate mostly as informal enterprises in developing countries. Most of the studies carried out on micro and small enterprises in Africa have identified financing (lack of access to capital) as the major constraints they face in the smooth running of their daily business activities (Peterson and Rajan, 1994; Berger and Udell, 1998; Cavalluzzo, Cavalluzzo and Wolken, 1999; Oyelaran-Oyeyinka 2006; Oyelaran and Lall 2006; Zeng 2008; Adeyeye *et al.* 2016, Egbetokun *et al.*, 2016; Jegede *et al.*, 2016, Jegede 2017a; 2017b; Oyelaran 2017). Despite the contribution of the informal sector to economic growth, attention hasn't been paid to it fully by governments and researchers as well.

There are lessons to learn from newly industrialising countries. For instance, China's rapid industrialization over the last few decades disconnect with the popular widely accepted path in which developed countries in Europe took – having some financial standard and framework (Allen, Qian, and Qian 2005). In particular, the vast majority of small firms had little or no access to credit from state-owned banks (Ruan and Zhang, 2009; Firth *et al* 2009;

Lin, 2011). Despite this major constraints, China has achieved industrialization in less than a quarter of the time it took Europe. How was China able to do this? Through the clustering mode of production (Allen, Qian, and Qian, 2005; Fisman and Love, 2003a; 2003b). It can be assumed that by dividing a cohesive production process (which agglomeration offers) into several incremental phases, clustering can lower capital entry obstacles, creating a pathway for more entrepreneurs to join production industries. Also, clustering promotes inter-firm trade credit therefore reducing the pressure of looking operating capital.

Nigerian entrepreneurs are taking a peek from the Chinese story and trying to follow the shorter part towards industrialization. The Nigerian government too has been supporting the development of clusters as through its industrial policy and programmes. The Nigeria Industrial Revolution Plan (NIRP) was designed to facilitate the development of industrial cities, parks, and clusters while focusing on making hard infrastructure available within these industrial zones. Currently Nigeria ranks second in West Africa in industrial cluster development (World Competitiveness Report, 2015). The top cluster destinations in Nigeria include: Newi (Automotive), Otigba (ICT), Yaba (Technology), Onitsha (Plastics), Aba (Footwear) and Kano (Leather). Besides these major clusters, there exists several hundreds of other smaller clusters. The government of Nigeria has also established several free trade zones in different geo-political zones of the country even though not all of these free trade zone in Nigeria were created by government at the Federal and State level, but these free trade zones have enjoyed the support of government. Within the free trade zones, goods may be landed, handled, manufactured or reconfigured, and re-exported without the intervention of the customs authorities. The government created and strengthened, an institution called the Nigerian Export Processing Zones Authority for promoting and facilitation local and international investments into license free zones in Nigeria. Table 1 shows the currently available free trade zones we have in Nigeria.

Table 1: Free Trade Zones in Nigeria

Name	Location	Developer	Land Size (ha)	Status
Calabar Free Trade Zone (CFTZ)	Cross River	Federal Government	220	Operational
Kano Free Trade Zone (KFTZ)	Kano	Federal Government	463	Operational

Tinapa Free Zone & Resort	Cross River	PPP	265	Operational
Snake Island	Lagos	Nigerdock Plc.	59.42	Operational
International Free Zone				
Maigatari Border Free Zone	Jigawa	State Government	214	Operational
Ladol Logistics Free Zone	Lagos	GRML	n/a	Operational
Airline Services EPZ	Lagos	Private	n/a	Operational
Sebore Farms EPZ	Adamawa	Private	2,000	Operational
Ogun Guandong FTZ	Ogun	PPP	10,000	Operational
Lekki Free Zone	Lagos	State Government	n/a	Operational
Abuja Tech Village FZ	FCT Abuja	FCT	702	Under construction
Ibom Science & Tech FZ	Akwa Ibom	State Government	122.14	Operational
Lagos Free Trade Zone	Lagos	Eurochem Technology	218	Operational
Olokola Free Trade Zone	Ondo & Ogun	PPP	10,500	Operational
Living Spring Free Zone	Osun	State Government	1,607.86	Under construction
Badagary Creek Integrated Park	Lagos	Kaztec Engineering	531	Under construction
Ogindigbe Gas Revolution Industrial Park (GRIP)	Delta	Alpha GRIP Development Co.	2,506.03	Under construction
Nigeria Aviation Handing Co. (NAHCO)	Lagos	NAHCO	10	Under construction
Nigeria	Lagos	Eko Atlantic FZ Ltd	1,000	Under

International Commerce City				construction
Ogogoro Industrial Park	Lagos	Digisteel	52	Under construction
Ondo Industrial City	Ondo	State Government	2,771.2	Under construction

Source: Compiled from <http://www.nepza.gov.ng/index.php/about/downloads>

This paper attempts to establish the link between clustering, financing, and firm performance, by exploring one of Nigeria's most successful clusters – the Otigba Computer Village. The study focuses on the Otigba Computer Village, in Ikeja, Lagos State, Nigeria, because it has been adjudged the biggest ICT market in Africa, the ICT hub of West Africa and the Silicon Valley of West Africa because of the size and volume of business activities carried out daily in the cluster (Oyelaran-Oyeyinka, 2006).

Statement of the Problem

Studies carried out in the Otigba cluster so far have evaluated size capacity, evolution of the cluster, mode of operation, performance, production capability, sustainability and constraints of the industry. Hence, this study was carried out on two hundred randomly selected microenterprises in the cluster. It examined how the success story how the micro and small enterprises in the cluster overcome the constraints of financing and how the enterprises managed to 'scale-up' since 'start-up'. It also shed some light on how the cluster grew from a business unit to over several hundred business units, became the biggest ICT market in Africa and a major contributor to the economy of Lagos State in Nigeria – a cluster that remained largely informal and outside of governments regulation and support.

Research Objectives

The study thus seeks to:

- a) Understand the dynamics of knowledge acquisition and diffusion in the cluster
- b) Investigate the forms of scaling-up among the enterprises in the cluster

Methodology

Conceptual Framework

Studies on industrial districts and networks was first popularise by Michael Porter (Porter, 1985;1990;1998) where he referred to these industrial districts and networks as clusters. Literatures have shown that the two main indicators for clusters are rapid firm growth and new firm entry (Porter 1990; Swann and Prevezer, 1996; Baptista, 1996; Porter, 1998; Beaudry et al., 1998; Swann et al., 1998; Baptista and Swann, 1999; Cook et al., 1999; Pandit *et al.*, 2000; 2001a, 2001b; Beaudry and Swann, 2001). Swann *et. al.* (1998) in their study also found out that enterprises in clusters are more innovative hence, grow faster than standalone enterprises. It also found out for high technology hubs, the strength of the science base in a cluster had a strong positive effect on new firm formation and growth of enterprises in that cluster. Other studies corroborated the fact industry location raises factor productivity (See for instance Henderson, 1986).

All the above listed researches outlined that being part of a cluster allows companies to productively source for inputs; access information, technology and institutions; and integrate with other enterprises both on the horizontal and vertical levels. This is because enterprises in vibrant clusters can take advantage of the proximity of a wide range of specialised and experienced human and financial capital, thereby lowering their research costs and learning time (Porter, 1998). In Saxenian's (1994) work, cooperation amongst enterprises may happen in different forms: cross-licensing, and joint technology purchase, patents agreements and joint-ventures. The study further buttressed the fact that proximity improves communications and interactions with the suppliers also. Another knowledge advanced in the work was that clustering creates avenue for monitoring and benchmarking with other enterprises in the cluster and industry.

Our study draws insight from these literatures. In our study, we proposed that knowledge sharing in geographical clusters leads to rapid knowledge diffusion which eventually leads to scaling-up of the enterprises in the cluster as well as the cluster as a whole. We also advanced our concept that scaling-up of clusters can happen in at most four stages viz: input stage, process/activity stage, output stage and finally impact stage. Hence, innovation as a result of knowledge sharing and diffusion can produce a combination of or any of the four stages of scaling-up.

Research Scope

The research was grounded on the collection of first-hand data, by developing and administering survey instruments designed to capture the attribute of the Otigba hardware

market, the channels of knowledge diffusion in the cluster and the different forms of scaling-up in the cluster. The survey results were used for undertaking descriptive analyses responding to the study's objectives. The information gathered was benchmarked with additional information from literature.

The study included developing a methodological framework capturing cluster attributes, knowledge diffusion and forms of scaling-up in the informal ICT enterprises in the cluster and undertaking full scale surveys on two hundred informal (200) ICT microenterprises randomly selected from the approximately four thousand (4000) microenterprises in the cluster representing an estimated 5% of the cluster population.

Research Instruments and Subjects

The main research instrument was a set of questionnaire administered on the owners of the business units at Otigba hardware market. These microenterprises comprise of businesses having employee size of less than ten offering a range of technical services such as:

- (i) networking services,
- (ii) production/installation,
- (iii) branded computer/equipment,
- (iv) sales of hardware and software of computer,
- (v) IT services/marketing,
- (vi) general IT maintenance and repairs,
- (vii) assemblage of computer& accessories, and
- (viii) sales of peripherals & other items.

Results and Discussion

Table 2 further reveals the nature of the cluster. All of the firms reported that they usually exchange information with other technicians, share experience with other technicians, engage technicians from other firms, and share tools and equipment with other technicians, though none of them had a joint purchase of expensive equipment and importation of inputs. The reason for this disparity could be to avoid the conflict that comes with joint venture. Also the cluster placed more emphasis on sharing what they had than combinational effort.

Table 2: Modes of Open Innovation Mechanism in the Cluster

	N	Min	Max	Mean	Std. Dev.
Exchanging information with other technicians	200	0	4	3.45	.855
Sharing experience with other technicians	200	0	4	3.20	1.130
Engaging technicians from other firms	199	0	4	3.17	1.172
Sharing tools with other technicians	200	0	4	3.07	1.354
Sharing equipment with other technicians	200	0	4	3.03	1.398
Joint purchase of expensive equipment	197	0	4	0.32	.644
Joint importation of inputs	194	0	4	0.14	.529
Valid N (listwise)	193				

Scale

Always = 4

Usually = 3

Occasionally = 2

Rarely = 1

Not at all = 0

Dynamics of Knowledge Acquisition and Difussion in the Cluster

The acquisition and development of technology knowledge (i) relates to an entrepreneur's ability to create products that meet market demands (Clarysse *et al.*, 2011), (ii) helps them respond to changing markets via rapid product development and (iii) allows them to stay abreast of technical changes related to venture performance. In the Nigerian setting, apprenticeship was common in the informal settings as most firms do not have sufficient money that is required for formal training. Hence, they had to learn on the job in the form of apprenticeship. Fig. 1 shows that the firms had acquired the skills they have principally through the training. Hence, the traditional apprenticeship system was the most important process of acquiring skills. This supports Oyelaran (1997) and Akinbinu (2001) whose reports showed that the general mechanism for technological learning was the external training of new staff on-the-job. To buttress this, the duration of the apprenticeship was also considered. This is in line with Oyelaran-Oyeyinka (2006) that shows that learning-by-doing was an important component of non-formal learning in the African small firms which are rooted in crafts apprenticeship. Most of the businesses asserted that they carry out internal

trainings in their enterprises as a means of knowledge development (Fig. 2). According to Burger & Gochfeld (2008) and Burger & Shaffer (2008), technology development implies firms having relevant knowledge regarding the products, technologies, and/or processes that pertains to their business. The study showed that majority of the firms upgraded their knowledge weekly (Fig. 3). The essence of upgrading weekly was to keep abreast with customer's needs. They major in the repairs of phones, laptops, e.t.c, and this are products that come with a lot of technical changes as the products change from the producers. This is one of the reasons why the firms upgraded often so as to have the latest technical requirements as the market changes. Another way through which the firms develop their knowledge was through trainings sourced within the enterprise, as shown in Table 4. This was in contrast to Oyelaran-Oyeyinka (1997) that report that external training was the general mechanism for technological learning. Other modes of transferring knowledge among the employees, aside training include learning under experienced personnel. Over 50% of the firms claimed this claim (Fig 5). Learning through experienced personnel literally means learning the easy way as the apprentice tends to learn from the mistake of the superior and hence shorter learning duration. About 40% reported that they acquired knowledge through the simple task that was been assigned to them while only about 10% said that assignment of task with close supervision was the method through which they acquired knowledge.

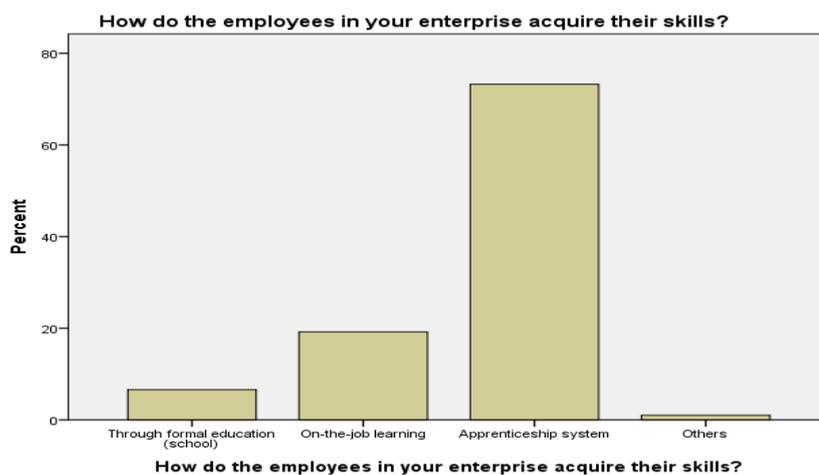


Figure 1: Ways through which Employees Acquire Skills

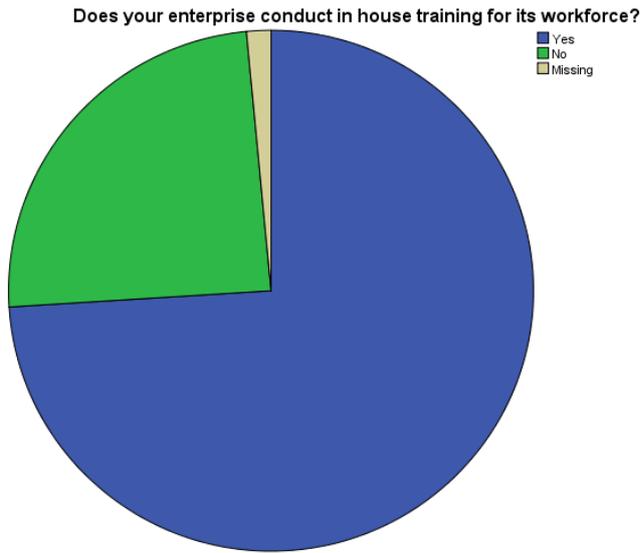


Figure 2: Existence of In-house Training

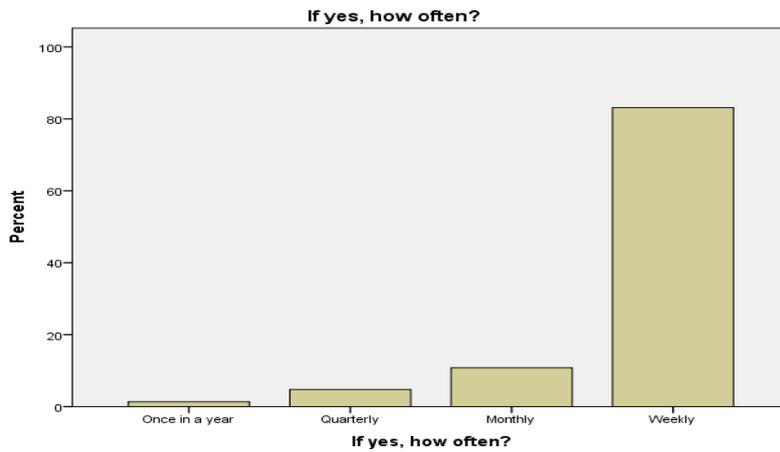


Figure 3: Rate of Knowledge Development in the Cluster



Figure 4: How the Firms in the Cluster Conduct Training

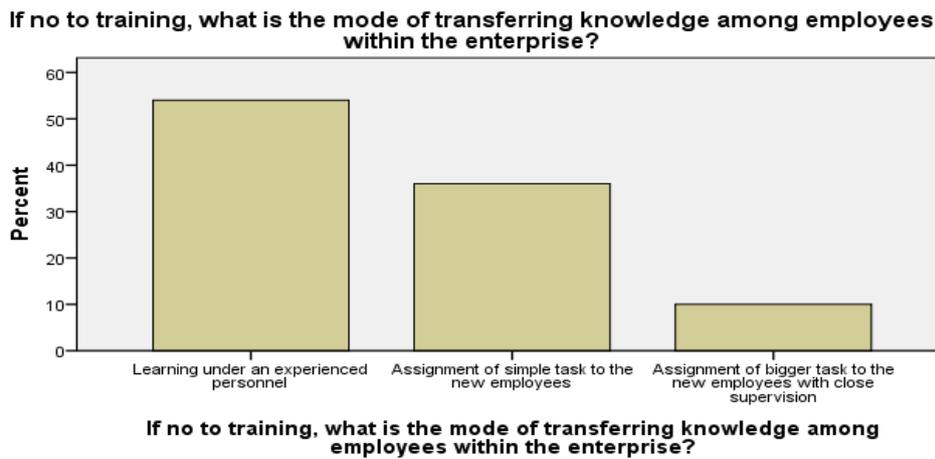


Figure 5: Other Modes of Transferring Knowledge Aside Training

One channel of diffusing knowledge in the enterprises and in the cluster was through rotation of jobs (Fig 6). Table 3 shows that about 55.5% reported that allotting task with close supervision was the utmost diffusion mechanism. Another diffusion mechanism was 26.5% in-house training and 16.5% allowance of employees to collectively undertake task. This way, the employees would be able to work with their hands, know their ability, learn from

their mistakes and improve as time goes on. This may be relatively slow as compared to receiving the formal type of training but it has been proven to be worth the while as the employee tends to retain all the experiences they gain from this process and in no time gain independence to start-up their own. Informal knowledge diffusion method is a proven method of advancing a cluster as shown by the Otigba cluster.

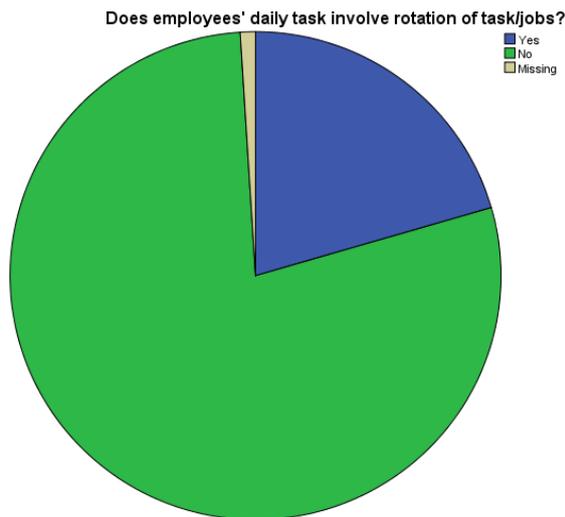


Figure 6: Rotation of Jobs

Table 3: Knowledge Exchange Mechanism for Knowledge Diffusion

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Allotting task with close supervision	111	55.5	56.1
	in-house training	53	26.5	82.8
	Allowing the employees to collectively undertake task	33	16.5	99.5
	Others	1	.5	100.0
Total	198	99.0	100.0	
Missing	System	2	1.0	
Total	200	100.0		

Figure 7 illustrates that majority of the firms reported that there were informal association. They affirmed that the associations that existed were CAPDAN and COPTON. These associations regulate knowledge dissemination amongst them.

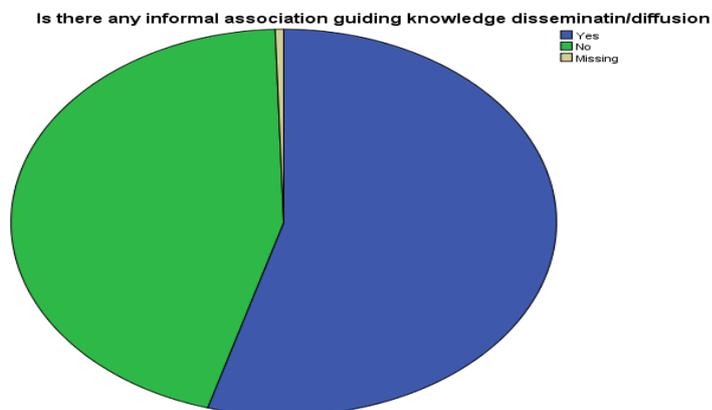


Figure 7: Informal Associations Guiding Knowledge Dissemination in the Cluster

Forms of Scaling-up Among the Micro Enterprises in The Cluster

The study captured scaling-up using four proxy variables viz: (i) improved access to finance, (ii) increase in workforce, (iii) percentage increase in gross earnings of the enterprises and (iv) percentage increase in gross sales. Most of the enterprises increased their capital base or accessed larger funds after inception (Fig. 8). The source of increased fund was majorly through commercial banks followed by co-operative societies (Fig. 9). These were trailed by business angels and micro-credit organisations. It is noteworthy that interest rates, charged by commercial banks in Nigeria, are usually in the two digits - about 20% or more. It takes a serious-minded entrepreneur to venture into taking such loans considering the risks involved. However, co-operative societies have been a common feature of the traditional African societies. Farmers co-operate to clear farm lands, plant and even harvest crops. This has been corroborated by earlier cluster studies in Nigeria where auto-mechanics were found to co-operate on such areas as sharing of information and utilities, joint savings and credit schemes, sharing of tools, machinery and equipment, learning/apprenticeship (Akinbinu, 2001; 2003; Oluwale, Ilori and Oyebisi, 2013). Majority of the enterprises increased their work force to run their businesses (Fig. 10). Most (18%) of the enterprises had an increase of 2 employees

over the years, while 1% had an increase of 9%, 12% and 14% (Fig. 11). About 45% had an increase in the number of employees ranging between 1 and 5, 10% had an increase in the number of employees ranging between 6 and 10 while 3.5% had an increase in the number of employees ranging between 11 and 14. The modal value of an increase of two employees is plausible since most of the enterprises were sole proprietorship which may not be able or favourably disposed to employing many hands.

In the last years, did your enterprise increase its capital based or accessed larger funds to run the business?

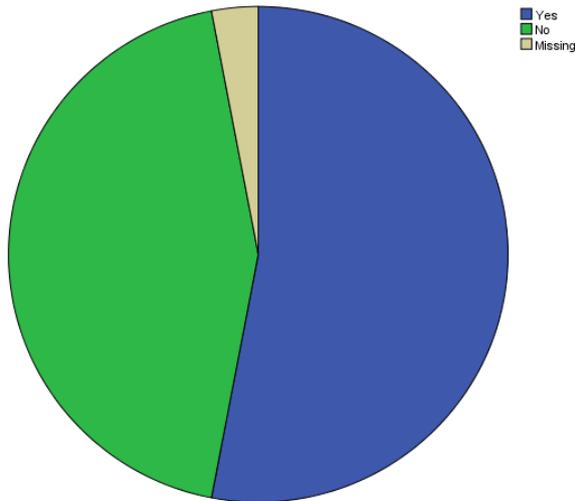


Figure 8: Increase in capital base or access to larger funds to run business

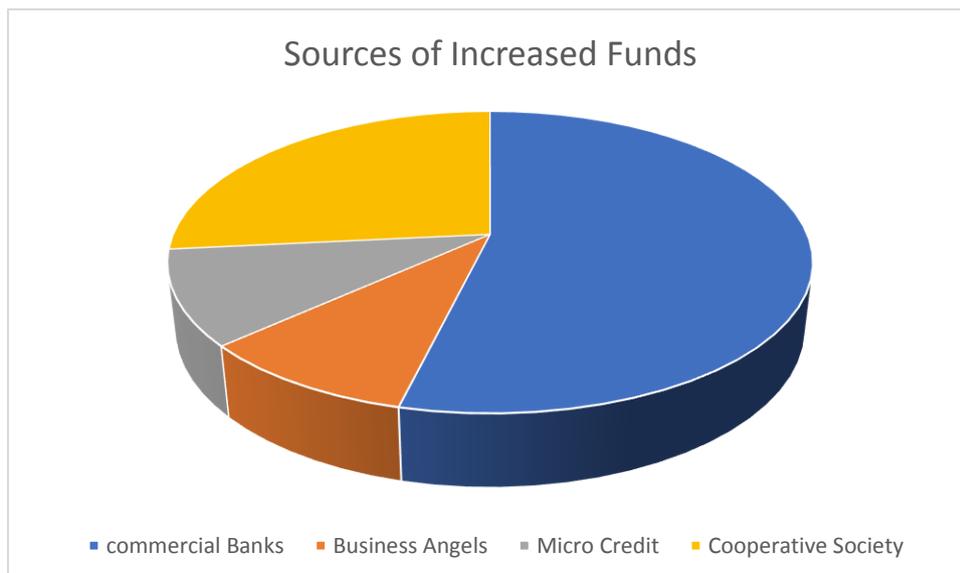


Figure 9: Sources of increased fund

In the last years, did your enterprise increase its work free (permanent or contract employees) to run the business?

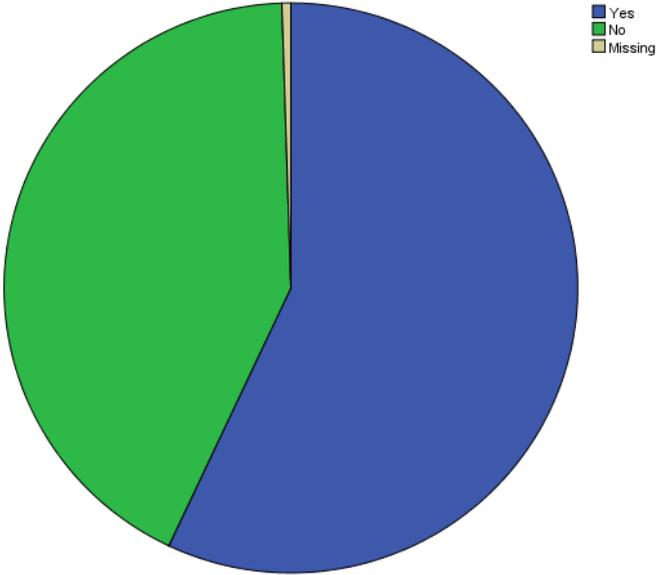


Figure 10: Enterprise’s increase of work force to run business

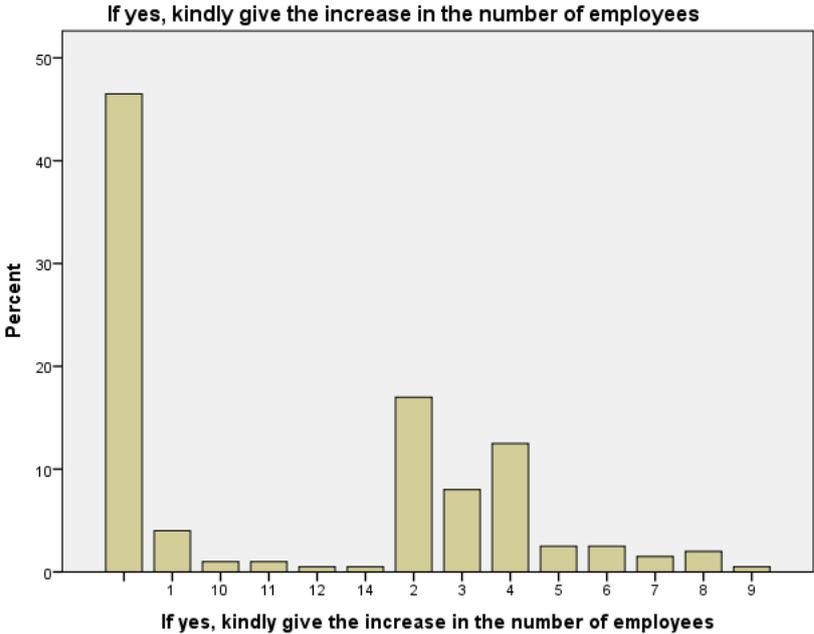


Figure 11: Increase in the number of employees

Most of the enterprises recorded increase in their annual gross earnings over the years which is a positive sign of growth (Fig. 12). The growth in annual gross earnings was less than 15% for most of the firms' while only few had increase in annual gross earnings ranging between 20% and 25% (Fig. 13). In the same vein, most of the enterprises recorded increase in their annual sales volume over the years as a sign of growth (Fig. 14). The growth in annual sales volume was also less than 15% for most of the firms' while only few had increase in annual gross earnings of between 20% and 25% (Figure 15). According to our earlier definition of scaling up, definitely the firms were experiencing some scaling-up in their activities.

In the last year, did your enterprise record increase in its annual gross earnings?

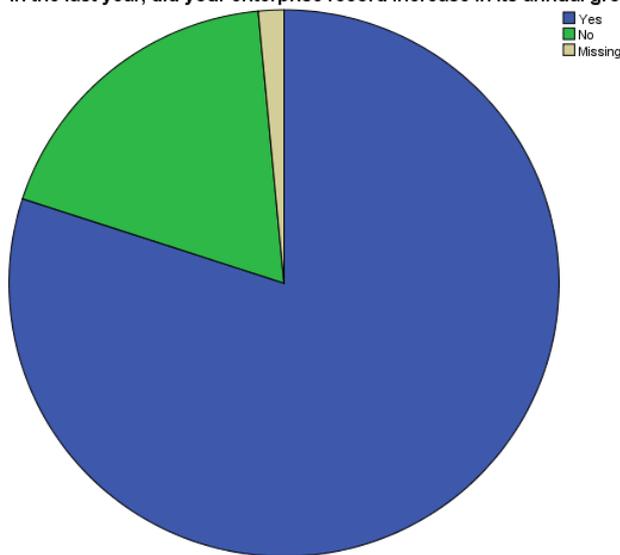


Figure 12: Firms' increase in annual gross earnings

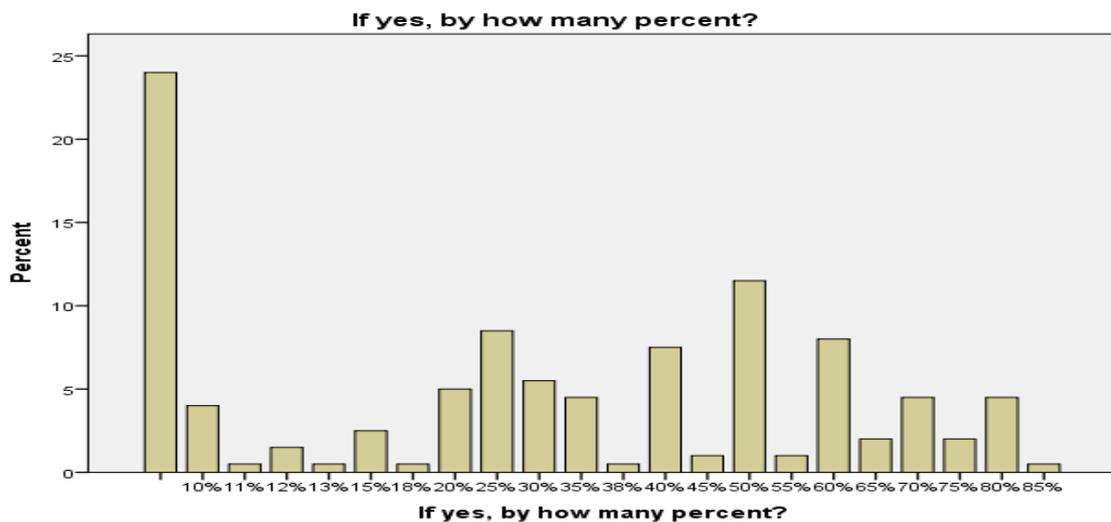


Figure 13: Percentage growth of enterprises in annual gross earnings

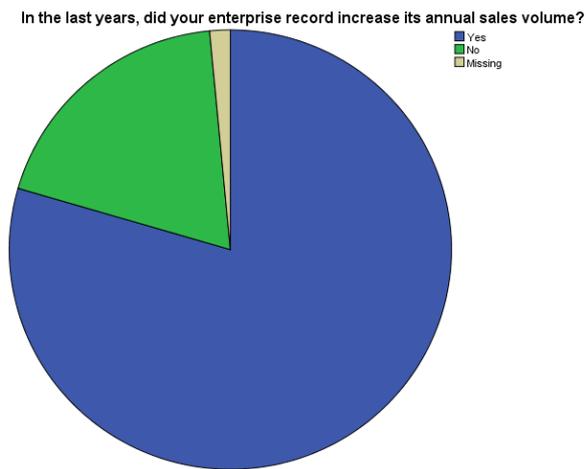


Figure 14: Firms' increase in annual sales volume

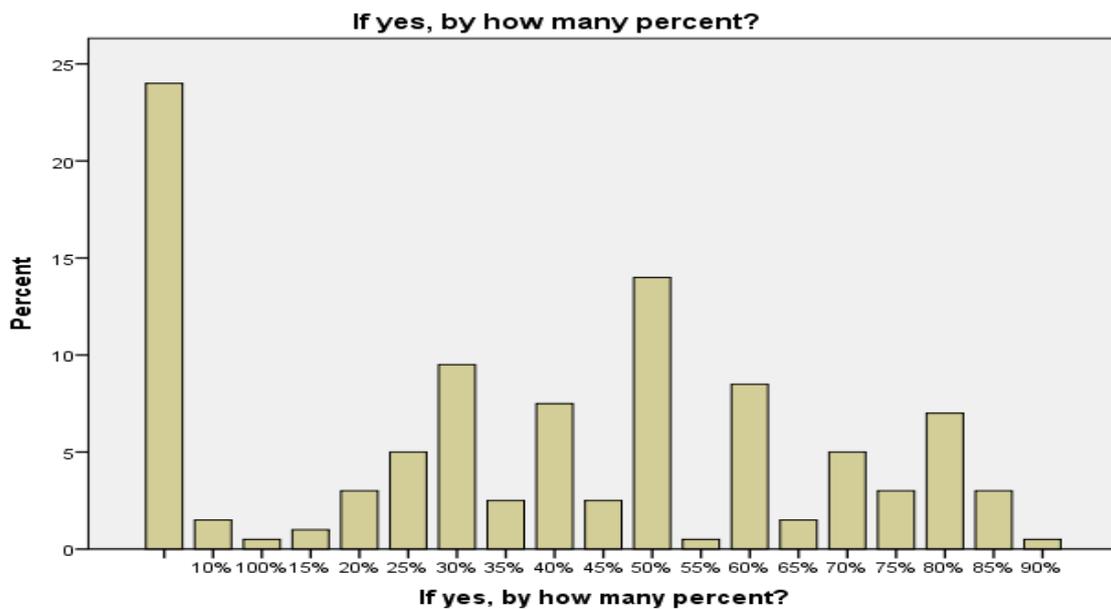


Figure 15: Percentage growth of enterprises in annual sales volume

Conclusion

A major reason for the rapid growth in the cluster was knowledge sharing not access to finance. There was serious emphasis on sharing knowledge, skills and ability that each enterprise had to collectively compete. The nature of open collaborative innovation in the

cluster was through cooperation to collectively compete as a cluster (with international market).

In the cluster, knowledge acquisition was achieved either through formal methods (university education and trainings) and informal method (apprenticeship system and indigenous knowledge systems). However, apprenticeship system of education was the most used channel of acquiring knowledge in the cluster. Knowledge diffusion was communal in the cluster. especially with the presence of trade associations/union guiding wide dissemination of knowledge in the cluster. This is because of the monitoring role played by trade association/unions such as CAPDAN and COMPTON evidently present in the cluster. Amongst other reasons, knowledge sharing and diffusion influenced scaling-up in the cluster -this manifested principally in increase in number of employees within enterprises. Improved access to finance, increase fine gross earning and increase in gross sales Hence, knowledge sharing was seen an instrument of collective advancement (open development).

Implications of the Study

The practice of open collaborative innovation among knowledge-based enterprises/networks has been found to be highly productive in overcoming the barriers to accessing finance in the cluster. It is therefore highly recommended that government, unions, professional bodies, trade associations and self-help organizations buy into this, as knowledge sharing and collaborative problem solving approaches represent the currency in which enterprises in clusters need to trade with. How much an enterprise knows, how fast they can learn something new, and how much knowledge it is willing to volunteer determine the vibrancy of the enterprise not really how much it has.

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