OPPORTUNITIES AND CHALLENGES OF ZAMBIA'S MANUFACTURING INDUSTRY, IN THE WAKE OF THE MULTI-FACILITY ECONOMIC ZONES

By

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Declaration

I, **Sikozi Kazwala Emmanuel,** do hereby declare that this dissertation is authentically my own, and all the work of other people has been duly acknowledged. Therefore, to the best of my knowledge, no similar work has previously been submitted for a degree award at this or any other University. All figures, charts and tables, with the exception of those whose sources have been acknowledged, are original.

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Approval

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Dedications of this piece of work go with fond memories to: My late mum, dad and sister Nachula Samfolonsa (04th April, 1994), Vincent Toyo (19th July, 1998) and Patricia (16th August, 2012), respectively.

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List of Acronyms and Abbreviations

ABC	Cost-Benefit Analysis
AGOA	Africa Growth Opportunity Act
BGRIMM	Beijing General Research Institute of Mining and Metallurgy
BIs	Business Incubators
BPR	Business Process Re-engineering
CADF	China-Africa Development Fund
CDC	Coega Development Corporation
CBD	Central Business District
CCECC	China Civil Engineering Construction Corporation
CCPC	Competition and Consumer Protection Commission
CDE	Centre for Development and Enterprise
CEEC	Citizens Economic Empowerment Commission
CIM	Computer Integrated Manufacturing
CM	Cellular Manufacturing
CNC	Computer Numerical Control
CNMC	China Non-Ferrous Metals Corporation
COMESA	Common Market for Eastern and Southern Africa
CSF	Critical Success Factors
CSO	Central Statistics Office
CSR	Corporate Social Responsibility
D/FDI	Domestic and Foreign Direct Investment
DRC	Democratic Republic of Congo
DRP	Distribution Resources Planning
EAZ	Economics Association of Zambia
ECC	European Economic Community
ECCI	Egypt-Chinese Corporation for Investment
EDB	Economic Development Board
EDI	Electronic Data Interchange
EPZs	Export Processing Zones

ETDZ	Economic and Technological Development Zone
EU	European Union
FDI	Foreign Direct Investment
FNDP[1]	First National Development Plan
FNDP[4]	Fourth National Development Plan
FNDP[5]	Fifth National Development Plan
FOCAC	Forum on China–Africa Cooperation
FTA	Free Trade Area
FTZs	Free Trade Zones
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
GMT	Greenwich Mean Time
GT	Group Technology
HIV/AIDS	Human Immuno-Deficiency Virus/Acquired Immune Deficiency Syndrome
IC	Investment Council
ICC	Investment Coordinating Committee
ICFTU	International Conference of Free Trade Unions
ICT	Information Communication Technology
ID	Industrial Development
IDA	Industrial Development Agency
IDC	Industrial Development Corporation
IDZ	Industrial Development Zone
IIS	Indigenous Import Substitution
IMF	International Monetary Fund
INDECO	Industrial Development Corporation
INDP	Interim National Development Plan
IPs	Industrial Parks
ISI	Indigenous Substitution Industrialisation
ISIC	International Standard Industrial Classification
JFTECZ	Jin Fei Trade and Economic Cooperation Zone

JIC	Just-In-Case
JIT	Just-In-Time
JV	Joint Ventures
LENCO	Lusaka Engineering Company
LMA	Livingstone Motor Assembly
LMC	Lumwana Mining Company
LMFEZ	Lumwana Multi-Facility Economic Zone
LNG	Liquefied natural gas
LS-MFEZ	Lusaka South Multi-Facility Economic Zone
LWSC	Lusaka Water and Sewerage Company
MBSA	Mercedes Benz South Africa
MFEZ	Multi-Facility Economic Zone
MMD	Movement for Multiparty Democracy
MNEs	Multi-National Enterprises
MOFCOM	Ministry of Commerce
MOST	Managerial, Organisational, Social and Technological
MSMEs	Micro-, Small- and Medium - Scale Enterprises
MVA	Manufacturing Value – Added
NCZ	Nitrogen Chemicals of Zambia
NERP	New Economic Recovery Programme
NISIR	National Institute for Scientific and Industrial Research
NLP	National Linkage Programme
NTBC	National Technology and Business Centre
OECD	Organisation for Economic Cooperation and Development
OEMs	Original Equipment Manufacturers
PACRA	Patents and Companies Registration Agency
PPP	Private-Public Partnership
PRC	Peoples Republic of China
R&D	Research and Design
RDA	Road Development Agency
RUCOM	Rural Commercial Industries

SADC	Southern Africa Development Community
SAP	Structural Adjustment Programme
SAR	Structural Adjustment Reform
SEZ	Special Economic Zone
SI	Statutory Instrument
SIDA	Small-scale Industries Development Act
SIDO	Small-scale Industries Development Organization
SLIUP	Singapore Local Industry Upgrading Programme
SPC	Statistical Process Control
SPV	Special-Purpose Vehicle
SPZ	Special Processing Zone
SPSS	Statistical Package for Social Sciences
$SNDP^2$	Second National Development Plan
$SNDP^6$	Sixth National Development Plan
SOE	State-Owned Enterprise
SSGEIP	Sub-Sahara Gemstone Exchange Industrial Park
SWOT	Strengths, Weaknesses, Opportunities and Threats
TECZ	Trade and Economic Cooperation Zones
TEDA	Egypt Economic-Technological Development Area
TFP	Total Factor Productivity
TNC	Trans-National Corporation
TNDP	Transitional National Development Plan
$TNDP^3$	Third National Development Plan
ToH	Triangle of Hope
ToH SAIED	Triangle of Hope-Strategic Action Initiative for Economic Development
TQM	Total Quality Management
UNCTAD	United Nations Conference on Trade and Development
USA	United States of America
VAT	Value Added Tax
WB	World Bank
WIP	Work-In-Progress

WTO	World Trade Organization
ZABS	Zambia Bureau of Standards
ZAM	Zambia Association of Manufacturers
ZAMEFA	Zambia Metals Fabrication
ZAMOX	Zambia Oxygen
ZAMTEL	Zambia Telecommunication Corporation
ZCC	Zambia Competition Commission
ZCCZ	Zambia-China Economic and Trade Co-operation Zone
ZDA	Zambia Development Agency
ZEMA	Zambia Environment Management Agency
ZESCO	Zambia Electricity Supply Corporation
ZIMCO	Zambia Industrial and Mining Corporation
ZNMEC	Zambia Non-ferrous Metals Explorations and Construction Limited

Abstract

China's use of Special Economic Zones (SEZs) to spur its remarkable economic development was seen as the way to go, particularly for least developing economies. Zambia, like most African countries, has established these zones with the help of the Chinese. In Zambia, the zones are called Multi-Facility Economic Zones (MFEZs), and are to operate as platforms for industrial development and creating value chains in addition to the much-needed jobs that they would create. Based on the Chinese experience and lessons, MFEZs are designed to be integrated into the domestic economy, as they are in China. It is envisaged that this approach would, through foreign direct investment (FDI), enhance the transfer to local industries the much-needed knowledge and technology, a prerequisite for modern industrialisation. If the MFEZs attract a critical mass of FDI, stimulate high value-added manufacturing activities, and generate productivity spill-over, their impact on industrial development in Zambia would be dependent on the domestic linkages created and the technology transfer achieved, both of which are a function of the local manufacturing absorptive capacity. This paper reports on the results of a survey undertaken to assess whether the Zambian manufacturing firms had the capacity or "technological readiness" to adopt any spill-over and/or absorb any technology transfer that takes place. The variables considered in this assessment were types of technologies and methods of production, manufacturing systems, and human resources development. The study established that there were low levels of advanced technologies, weaker innovative capacity and lower human capital (skills) threshold in local firms. To address these short-comings, recommendations in form of a two-pronged paradigm, involving the local manufacturing industry on one hand and Government on the other hand have been made. The local manufacturing industry needed to increase its absorptive capacity by investing in advanced technologies and innovations through partnerships with Trans-National Corporations (TNCs), Academia, Government and other stakeholders. Consequently, the Government must provide a conducive economic climate for both local and foreign investment through fiscal and non-fiscal incentives.

Keywords: *Foreign Direct Investment (FDI), Local Manufacturing Industry, Multi-Facility Economic Zone (MFEZ), Value Addition, Zambia*

CHAPTER 1

INTRODUCTION

1.1 Introduction

A strong and competitive manufacturing sector is a foundation for any country's economic growth. However, the manufacturing sector in Zambia has generally performed below expectations for the past three decades, starting from late 1980s (World Bank, 2009). Comparatively, Zambia's manufacturing average annual percentage growth rose from 0.8 in 1990 to 5.3 in 2007, while during the same period other countries in the region posted significant growth ranging from -0.3 to 20.2 for Angola, -8.7 to 6.3 for Democratic Republic of Congo (DRC), -5.8 to 6.7 for Rwanda, and 2.7 to 8.0 for Tanzania and among others (World Bank, 2009). Furthermore, in terms of Manufacturing Value Added (MVA) contribution to Gross Domestic Products (GDP) the sector grew by 2.7 percent annually between 2006 and 2010 period which translates into a cumulative growth of 13.5 percent (Central Statistics Office, 2011). This growth fell below the 15 percent contribution target. The poor performance is attributed mainly to lack of technological innovations and low investment in advanced technologies needed to add value to raw materials and differentiated products (World Bank, 2009). Consequently, most of Zambia's natural and agricultural resources were exported in raw form with little value addition. Undoubtedly, Zambia's membership to various regional and international trade organizations such as the Southern Africa Development Community (SADC), Common Market for Eastern and Southern Africa (COMESA) and World Trade Organization (WTO) would have provided ready and unsaturated markets for export of value-added manufactured products. Instead, the Zambian manufacturing industry collapsed due to competition from Zimbabwe and South Africa manufactured goods (Tangri, 1999).

Some of the contributing factors cited for the poor performance of Zambia's manufacturing industry include undeveloped infrastructure such as energy, electricity, rail, road and telecommunications, high financing costs and lack of access to financing institutions, macro-economic instability and administration (Micro-economics), uncertainty in Regulatory Policy (Tax rates), crime and corruption (World Bank, 2009). According to the Ministry of Commerce, Trade and Industry's Zambia Manufacturing Survey 2000 – 2001 Final Report (June 2007), the poor performance of the economy has been associated with low growth of exports in general and of manufacturing exports in particular, such as sugar, cotton, lime and cement among others. To address some of these short-comings, the Zambian Government embarked on specific interventions such as (GRZ-FNDP[5], 2006):

1) Structural reforms, which included; development and/or rehabilitation of infrastructure in cities, rural industrialisation by developing an appropriate infrastructure, establishment of technical exchange programmes with foreign countries to ensure access to affordable modern technology. The Government further proposed the establishment of linkages among agricultural farming blocks, industrial estates, and out-grower schemes in order to set up industries close to the raw material source, improvement of the regulatory frameworks and establishment of economic processing zones (EPZ), in order to enhance both export and locally-oriented manufacturing industries.
2) Other strategies implemented were macro-economic policy reforms, such as reduction in the inflation and interest rates, transparency in debt contraction and management, effective public expenditure and revenue management. In order to create a more investor-friendly environment which would support the manufacturing sector, other policy adjustments were made such as repealing the Investment Act of 1993 and replacing it with the Zambia Development Agency (ZDA) Act of 2006, later amended in April 2009 (No. 5 of 2009).

However, it is worth noting that while structural and macro-economic policies are vital in creating the pre-conditions for growth, the *efficiency* with which firms operate and the *strategic formulation* of policies which improve efficiency at the firm-level greatly

enhance the potential impact of the *macro-reforms* on the overall performance of the manufacturing sector and the economy at large.

Consequently, in its quest to accelerate local industrialisation, the Government of Zambia in partnership with the Japan International Co-operation Agency (JICA) agreed to implement the project called the Strategic Action Initiative for Economic Development - Triangle of Hope (SAIED-ToH) in 2005, to formulate and implement a model which could be successful in Zambia and Africa in general with special reference to East Asian experiences. (www.southsouthcases.info). The SAIED-ToH aimed at creating a platform for Zambia to achieve economic development by attracting significant Domestic and Foreign Direct Investment (DFDI) through the establishment of the Multi-Facility Economic Zones (MFEZs). The SAIED-ToH emphasised on political will and integrity, private sector dynamism and integrity, civil service efficiency and integrity as key forces that would enable the economy to attain accelerated economic development. The project was implemented with three important actors, Government, Public Services and Private Sector working hand-in-hand as Triangle of Hope. It paid special attention to how best successful economic development experiences in East Asia especially Malaysia, India, Thailand and China could be utilised in the context of present economic development challenges in Zambia as well as in Africa.

The development of the MFEZ in Zambia (Lusaka South MFEZ) by the Zambian Government in collaboration with Malaysian Kulim High Technology Park Corporation and JICA influenced other development partners like China, which also decided to develop a MFEZ in Chambishi and another Lusaka Sub-zone (Lusaka East Zone).

In the same vein, according to Bo (2006), cited by Brautigam and Tang (2011) more than ten African Governments expressed interest in hosting cooperation zones in 2006, when it became clear that China was offering an innovative new programme. Subsequently, the Forum on China–Africa Cooperation (FOCAC) held in 2006 in Beijing, China presented an opportunity to address long-term prospects for industrial

development. At this FOCAC, the Chinese Government pledged to support the establishment of Special Economic Zones (SEZs) in form of Multi-Facility Economic Zones (MFEZs) in Ethiopia, Mauritius, Nigeria, and Zambia (Davies, 2010).

Böhmer and Farid (2010) present the internationally accepted definition of Special Economic Zones as larger estates that could be considered cities on their own. They usually cover all industrial and service sectors and target both foreign and domestic markets. They provide an array of incentives ranging from tax to regulatory incentives. In addition, they permit on-site residence. It must be noted that SEZ, MFEZ, Export Processing Zone (EPZ), Industrial Development Zone (IDZ) and Economic and Technological Development Zone (ETDZ) are the same in terms of concept, implementation, financing and investment. For the purpose of this research the following definition of MFEZ has been adopted; the MFEZs are special industrial zones for both export- and domestic-oriented industries, with quality infrastructure in place in order to attract and facilitate establishment of world-class enterprises within the zones (Brautigam and Tang, 2011).

China's use of SEZs to achieve unprecedented industrialisation clearly shows that the success of economic zones depends on the extent to which they create linkages with the local economy thereby generating employment and increasing transfer of know-how (Böhmer and Farid, 2010). The robust results in China have demonstrated that, with better design, effective implementation and an appropriate institutional capacity, legal and regulatory framework, the benefits of MFEZ can be enormous. This study, therefore, sought to address the factors that would enable the local manufacturing firms participate in the MFEZs' manufacturing activities.

1.2 Background of the Manufacturing Sector Performance in Zambia

The first republic period (1964 - 1973) posted a rapid growth in the manufacturing sector due to high copper prices. However, the global oil crisis in 1973, followed by drastic fall of copper prices in 1974 and 1975 sharply plunged the sector's performance, mainly due to its backward and forward linkages with the mining sector. In 1976, the sector's growth increased from 105 percent to 130 percent but dropped to 100 percent in 1980, with the exception of Food, Beverages and Tobacco, Chemicals,

Rubber and Textiles sub-sectors (Central Statistics Office, 2011). Consequently, many industries closed while Multi-National Enterprises (MNEs) relocated to other countries, turning Zambia into a trading centre. The change of Government in 1991 brought about changes in economic policies. Under these economic liberalisation policies, there was an initiative to open up the domestic market in order to allow competitive trade and to encourage active participation of private entrepreneurs in all sectors of the economy (de Bruin and Tambatamba, 1995). It marked the beginning of the re-adjustment phase (from 2011 to date), and most state-run firms were privatised. The Movement for Multi-party Democracy (MMD) which formed government in 1991 liberalised the economy in order to develop a market-driven, competitive, dynamic and sustainable industrial sector dominated by the private sector with the Government providing an enabling environment.

However, the shift to liberalisation exposed Zambia's domestic markets to international competition and many enterprises lost considerable market shares. As illustrated in Figure 1.1, between 1992 and 1994 there was a sharp decline in the manufacturing value – added (MVA) in GDP from 37 percent to 11 percent, (Central Statistics Office, 2011), while the total manufacturing growth based on the Index of Industrial Production (IIP) plunged from 126 to 83 in 1998 (Central Statistics Office, 2011). The manufacturing sector is seen as a key linkage with the primary sectors (mining and agriculture) as it adds value to locally-produced primary products. The manufacturing value-added refers to the difference between the value of total outputs of a sector and the value of intermediate inputs (consumption), such as materials and purchased business services used in production for industries classified in International Standards Industrial Classification (ISIC) major division 4 (World Bank, 2009). It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.

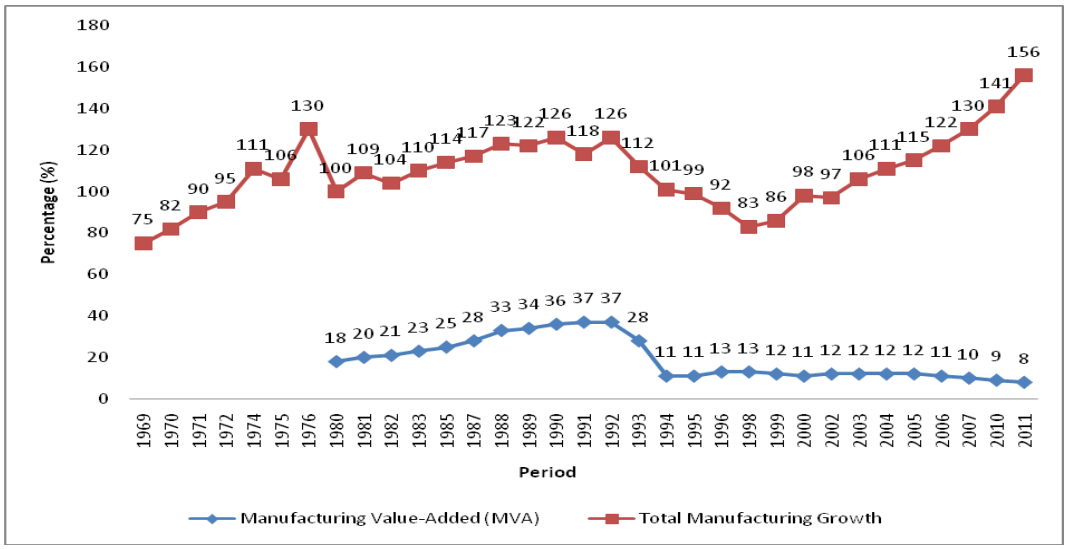
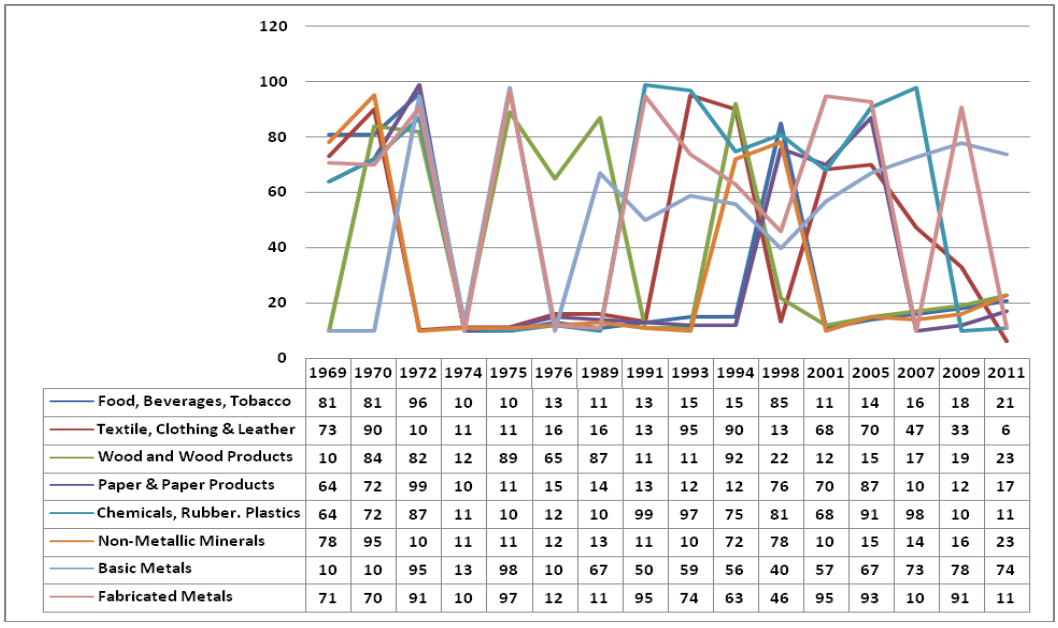


Figure 3.1: Structure of Manufacturing Value-Added and Total Manufacturing Growth (IIP)
(Source of Data: CSO National Accounts, 2008 - 2011)

Similarly, Figure 1.2 shows the growth of individual manufacturing sub-sectors between 1969 and 2011. Production in the manufacturing industry grew by an average of 54 percent between 1969 and 1976, compared to the period between 1991 and 2001 in which a decline of 22 percent was recorded. The high growth was mainly attributed to the increase in the Wood and Wood Products; Food, Beverages and Tobacco; Textiles, Clothing and Leather; Paper and Paper Products; Chemicals, Rubber and Plastics, and the Fabricated Metal products sub-sectors. The Fabricated Metals (copper cable, wire and rods) sub-sector recorded an output of 55 percent due to increased production of door and window frames, bolts and nuts and other construction materials, whereas the Non-metallic Mineral products (cement and lime) sub-sector grew by 51 percent compared to a growth of 11 percent recorded between 1991 and 2001, mainly on account of increased production of cement and lime for construction (Central Statistics Office, 2008).

The stagnation and decline in the economy was experienced between 1974 and 2001 chiefly on account of growth retardation in the Food, Beverages and Tobacco; Non-metallic Mineral products and Textile, Clothing and Leather sub-sectors (CSO National Accounts, 2011). The Textile, Clothing and Leather industries posted a record decline

of 71 percent due to increased importation of second-hand clothes from Europe and South East Asia, coupled with less trade in value added and processed products, and its performance continued to plummate up to 6 percent in 2011 (Central Statistics Office, 2011).



	1969	1970	1972	1974	1975	1976	1989	1991	1993	1994	1998	2001	2005	2007	2009	2011
Food, Beverages, Tobacco	81	81	96	10	10	13	11	13	15	15	85	11	14	16	18	21
Textile, Clothing & Leather	73	90	10	11	11	16	16	13	95	90	13	68	70	47	33	6
Wood and Wood Products	10	84	82	12	89	65	87	11	11	92	22	12	15	17	19	23
Paper & Paper Products	64	72	99	10	11	15	14	13	12	12	76	70	87	10	12	17
Chemicals, Rubber. Plastics	64	72	87	11	10	12	10	99	97	75	81	68	91	98	10	11
Non-Metallic Minerals	78	95	10	11	11	12	13	11	10	72	78	10	15	14	16	23
Basic Metals	10	10	95	13	98	10	67	50	59	56	40	57	67	73	78	74
Fabricated Metals	71	70	91	10	97	12	11	95	74	63	46	95	93	10	91	11

Figure 1.4: Growth of Individual Manufacturing Sub-sectors (IIP): 1969 - 2011. (Source of Data: CSO National Accounts, 2008 and 2011)

The Paper and Paper products and the Chemicals, Rubber and Plastics sub-sectors recorded declines in output of 64 percent and 32 percent, respectively, during the period under review. However, between 2001 and 2011, the total production grew steadily, which could be mainly attributed to positive growth in the Food, Beverages and Tobacco, and Wood and Wood Products sub-sectors of 99 percent each, Paper and Paper products sub-sector (104 percent), and the Non-metallic Mineral products, which recorded a historical increase of 128 percent mainly due to increased construction activities in the mines and exports to the Republic of South Africa, Malawi, China, Congo DR, Rwanda and Burundi. This significant upsurge was directly attributable to developments in the Agricultural sector and increases in domestic demand and exports to regional markets such as SADC and COMESA (Central Statistics Office, 2011).

1.3 Problem Statement

Despite numerous and massive volume of development assistance to Africa over the last four decades, African countries have been left out from global industrialisation while Asian countries which had gained political independence around the same time as African countries have experienced rapid industrialisation. Since the 1970s several African Governments including Zambia had launched the MFEZs in form of export processing zones (EPZs) or special economic zones (SEZs) (Farole, 2010). While it is true that some African countries do have notable, market-driven, "bottom-up" clusters of industries such as the footwear cluster in Aba and the vehicle parts cluster in Nnewi in Nigeria, as well as Mauritius and the Republic of South Africa, being referred to as the successful cases of establishing SEZs, there are no tangible outcomes of SEZs programmes on the African continent to date (Farole, 2010). According to the World Economic Forum (2009), most African industries have largely struggled to compete globally, due to such factors as lack of policy stability, poor infrastructure, and high indirect costs related to a poor business environment (Brautigam, Farole and Tang, 2010).

Other major reasons for the poor outcomes in previous attempts to establish special zones in Africa, include problems with local management, incentives, location, design and maintenance, promotion, and weak governance (Cling and Letilly, 2001; Watson, 2001; FIAS, 2008).

It is against this background that several questions have been raised on the mechanisms which are employed to explore alternative approaches to accelerating economic development. Given the current industrialisation base in Zambia and many other Sub-Sahara African countries, it is believed that the MFEZs would help revamp and sustain the manufacturing sector. This, therefore, necessitated an examination of whether the manufacturing sector in Zambia possesses the requisite variables for integration into the production chains in the established MFEZs, and reap the potential benefits of having access to international markets, finance, technology, management skills and knowledge.

The prime objective of study was to critically examine the readiness of Zambia's manufacturing sector to be integrated into the Multi-Facility Economic Zones' value chains.

1.4 Research Questions

The study was guided by the following research questions:

i. What are the key success factors for partnership readiness with Trans-National Corporations (TNCs)?
ii. What are the levels of the absorptive and innovative capacities of local manufacturing companies based on the key success factors?
iii. How should the short-comings in the absorptive and innovative capacities of local companies be addressed?

1.5 Objectives of the Study

1.5.1 General Objective

i. To investigate the readiness of Zambia's Manufacturing Industry to integrate into MFEZ manufacturing value chains.

1.5.2 Specific Objectives

i. To identify the key success factors for partnership readiness with Trans-National Corporations (TNCs).
ii. To investigate the levels of the absorptive and innovative capacities of local manufacturing companies based on the key success factors.
iii. To recommend remedial measures to address short-comings in the absorptive and innovative capacities of local companies.

1.6 Justification and Significance of Study

Being part of the global village, there is need for Zambia's manufacturing sector to be more competitive and responsive to global markets. Customers today are always demanding for customised and/or variety of innovative value-for-money products, which can only result from technological innovation and manufacturing systems

management such as Total Quality Management (TQM), Lean Production and Just-In-Time (JIT) among others. However, this competitive edge can never be achieved, unless the Zambia's manufacturing industry re-aligns itself or is integrated into the global value chains of production in MFEZs.

Furthermore, the study is likely to assist the Zambian Government and other stakeholders in providing suggestions to redress some of the short-comings in policy and strategic formulation at firm and sectoral levels, and the implementation aimed at improving the overall manufacturing sector performance and much-needed objectives to aid sustained economic growth.

The study not only makes a significant contribution to the new specific body of knowledge on manufacturing sector performance and foreign direct investment in Zambia by relating theory to practice, but it also looks at the appropriateness of the technology and the extent to which it is diffused into the local manufacturers. The central objective of this study is to contribute to our understanding of how the MFEZ concept has been successfully employed in other Asian and African countries to improve manufacturing performance and their respective economies over the years.

1.7 Scope of the Study

The study covered the period from independence in 1964 to 2013, as it is the period during which several structural and macro-economic interventions were made to improve, resuscitate and re-position the manufacturing sector in the economy, through various National Development Plans (NDPs), under the tutelage of a National Commission for Development Planning (NCDP). However, the collection of data for the study was undertaken over a period of three years from March, 2011 and November, 2013 and so was the data entry, process and analysis.

The study targeted active manufacturing firms spread all over Zambia. However, the preference was given to the firms located in geographical locations which were selected for the establishment of the MFEZs such as Lusaka, Kabwe, Ndola, Chambishi, Solwezi and Livingstone.

1.8 Structural Organisation of the Dissertation

The dissertation comprises seven chapters. Chapter 1 sets the stage by discussing the background of the problem and the problem statement followed by the research questions and research objectives. It also presents the justification and the significance of the study, the scope and the structural organisation of the study. Chapter 2 is a review of literature which outlines the evolution of the manufacturing sector in Zambia, the interventions in form of National Development Plans that the Zambian Government has endeavoured to implement since 1964. It also highlights the investment policies and the supporting Acts enacted from 1977 through 2013. Furthermore, Chapter 2 touches on other empirical studies that have been undertaken to address the performance of the manufacturing sector and other areas of possible deficiency in which this dissertation makes a contribution, including the prospects and challenges of Special Economic Zones.

While Chapter 3 presents the theoretical and conceptual framework of the study, Chapter 4 covers data sets; methodology used which includes sampling procedure, the sampling frame and sample size considered, the sources of data, data collection instruments and analytical techniques and tools employed. Chapter 5 presents the major research findings, results and analyses of data, while discussions of research findings are covered in Chapter 6. Finally, conclusions and recommendations in form of an integrative reference model for industry linkages are presented in Chapter 7. Limitations of the study and recommendations for further studies on MFEZs and IPs are also outlined in the seventh chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The prime objective of this chapter is to provide input to the question of whether the Zambian manufacturing sector is ready for integration into the MFEZ value chains. The chapter provides theory supported by empirical arguments underlying the development of the manufacturing sector and the contribution it has made to the Zambian economy. It is categorised into three sections. The first section presents the background of the macro-economic and structural interventions the Zambian Government, like most African Governments, have endeavoured to implement in order to improve and resuscitate the manufacturing sector from 1964 to 2013. The second section reviews and discusses the Special Economic Zones (SEZs) concept and how China has employed these zones to spur its remarkable economic development. Accordingly, of added value, the section also discusses the zones programmes initiated by China in her Africa's "Going Global" policy, illustrating zones' prospects and risks, and the strategic issues related to the implementation of zones in Africa. Comparatively, the section also provides an overview of the background and history of SEZs in Mauritius and the Industrial Development Zones (IDZs) in the Republic of South Africa (RSA). The final part of the second section of the chapter examines the design and development of the Multi-Facility Economic Zones (MFEZs) in Zambia and then concludes. The third section elaborates on the creation of linkages and synergies among industrial players in the special economic zones. It looks at SEZ as an instrument for micro, small and medium-sized enterprises (SMEs) internationalisation. The last segment of the section touches on the contribution of TNCs to the transfer and diffusion of technology and skills for sustainable development and later summarises.

2.2 Development of Manufacturing Industry in Zambia, 1964 – 2013

When Zambia attained her political independence from Britain on October 24, 1964 it was one of the most prosperous countries in Africa and appeared to have a bright future. The prosperity of the economy was largely dependent on the huge deposits of copper in the northern part of the country. During the early post-independence period (1964 – 66), Zambia pursued an open-market-oriented economy with minimum Government participation through the Transitional National Development Plan (TNDP). During this period, the economy posted positive prospects supplemented by favourable copper prices. However, the inherited low level of industrial development forced the Government of the day to adopt new economic policies which were aimed at diversifying the economy into mainly agriculture and manufacturing. Most foreign-owned firms were nationalised, and a centralised planning was embarked upon, under the direction of a National Commission for Development Planning (NCDP).

2.2.1 An Overview of the National Development Plans (NDPs)

The Zambian Government, in a bid to expand the agricultural production, industrial and mining diversification, in order to enable substantial import substitution through conversion of local raw materials launched several National Development Plans (NDPs), between 1965 and 2015, namely:

1. The First National Development Plan (FNDP[1]) was developed in the late 1965, to cover the period from July 01, 1966 to December 31, 1970. This plan envisaged a diversification away from copper-dependent to agriculture and industry. The plan aimed at setting up a number of new industries with the object of import substitution so that local demand can be met by local production (GRZ Economic Report, 1977). During the same period, the Mulungushi Reforms of 1968 and the Matero reforms of 1969 were launched in which the Government declared its intention to acquire an equity and/or more (51 percent or more) shareholding in a number of key foreign-owned firms. Whereas the Mulungushi reforms led to the take-over of important manufacturing and commercial entities by the Zambian Government, the

Matero reforms gave power to the Zambian Government to take-over and nationalise the mining companies such as the AAC (McGrath and Whiteside, 1989). Overall, there was a 30 percent increase in the establishment of industrial units during the FNDP[1] period, from 412 firms to 535 firms as illustrated in Table 2.1. A major expansion was evident in metal-working sub-sector because of linkages with the mining sector, and in textiles, mainly involved garment making, spinning and weaving or knitting activities (GRZ Economic Reports, 1977).

Table 2.1: Number of Industrial Establishment in Zambia and MVA (£'m), 1965 - 1969

Category	Number of Industrial Establishment		MVA (£'m)		
	1965	1969	1964	1970	%
Food	64	65	2.1	4.4	109
Beverages	27	7	2.8	5.9	111
Tobacco Manufacturing	2	1	2.8	5.9	111
Textiles and Clothing	68	101	0.6	2.3	283
Leather and Footwear	2	4	-	-	-
Timber	40	43	1.0	3.3	230
Paper, Pulp and Cartons	6	12	0.7	1.4	100
Printing and Publishing	19	23	0.7	1.4	100
Chemicals	15	28	1.8	5.1	183
Petroleum and Coal derivatives	1	2	3.2	-	-
Rubber products	9	11	1.8	5.1	183
Glass and China clay	1	1	-	-	-
Plastics	2	13	-	-	-
Building materials	51	36	3.4	5.2	53
Non-ferrous metals	2	3	3.2	7.1	121
Metal-working/engineering	98	171	0.2	0.6	200
Others	5	14	10.2	30.3	193
Total	**412**	**535**	**33.5**	**51**	**-**

Source: FNDP[1]

2. The Second National Development Plan (SNDP[2]), which was launched in January 01, 1972 to run up until December 31, 1976 specifically aimed at fuller utilisation of existing capacities, increasing Indigenous Import Substitutions (IIS) of food products, consumer goods and certain intermediate and capital goods. In order to counter the effects of low copper prices in 1974/5 and oil crisis of 1972/3 on the performance of the manufacturing sector, the Government undertook institutional reforms such as the Industrial Development

(ID) Act 18 of 1977, whose objective was to promote Import Substitution Industrialisation (ISI) (GRZ Economic Reports, 1977).

3. The Third National Development Plan (TNDP[3]), 1979 – 1983, emphasised on the goals of self-reliance and socialism within the national philosophy of Humanism. The plan's specific objectives were to promote Indigenous Import Substitution (IIS) and export-orientation, to pursue an integrated approach towards industrialisation by establishing industries which are closely linked with each other, such as agro – processing, copper and copper-alloys, engineering, building materials and other non-metallic products, and chemicals.
4. The Fourth National Development Plan (FNDP[4]) was launched in 1989 to run up to 1993, although it was abandoned in 1991 by the Movement for Multi-party Democracy (MMD) Government, which came to power after the re-introduction of multi-partism. The plan's specific objectives included; diversification and development of capital goods industry, and encouraging development of indigenous technology, among others.

2.2.1.1 Vision 2030 - Becoming "A prosperous Middle-Income Nation by 2030"

The Vision 2030, Zambia's first ever written long-term plan, expresses the aspirations of the Zambian people to be accomplished by the year 2030. It articulates the appropriate national and sectoral goals to meet people's aspirations. It is based on policy-oriented research on key national strategic issues and on a process of discussion and dialogue with the private sector, civil society and the general citizenry on the long-term goals and future of Zambia. The Vision 2030 outlines the desirable long-term paths of the socio-economic indicators to satisfy the people's aspirations, and articulates possible long-term alternative development policy scenarios at different points through the target year 2030. It is, therefore, the basis for interface by all sectors and provides direction for short- and medium-term plans. The Vision 2030 was to be operationalised through the implementation of five national development plans, beginning with the FNDP[5], covering the period 2006 - 2010 (GRZ - Vision 2030, 2006).

The main vision of the Vision 2030 is to make a nation with an economy which is competitive, self-sustaining, dynamic and resilient to any external shocks, that supports stability and protection of biological and physical systems and is free from donor dependence. In addition, the nation should have stable social and cultural systems that support human capital formation. Among other things, the nation Zambians aspire for should be characterised as follows:

i. Diversified, balanced and strong industrial sector, a modern agricultural sector and an efficient and productive services sector; a fully integrated rural based agro-based and light-manufacturing industry by 2030;
ii. Technologically proficient, fully able to adapt, innovate and invest using its human and natural resources;
iii. Technology-based and export-focused manufacturing sector, with strong and cohesive industrial linkages in the primary, secondary and tertiary sectors; which is dynamic and competitive with effective entities that add value to the locally abundant natural resources by 2030;
iv. A nation in which science, technology and innovations are the driving forces in national development and competes globally by 2030, through:
    - Acquiring and upgrading infrastructure required for training in science, technology and R&D in all academic institutions by 2030;
    - Building and sustaining human resource capacities and capabilities by 2030;
v. Sustained high and increasing productivity levels with regard to every factor of production; and universal access to clean, reliable and affordable energy at the lowest total economic, financial, social and environmental cost consistent with national development goals by 2030;
vi. A robust and competitive transport and communications network that services the region; and
vii. Strong entrepreneurial capabilities, self-reliant, outward looking and enterprising, where nationals take advantage of potential and available opportunities.

2.2.1.2 The Fifth National Development Plan (FNDP[5]), 2006 – 2010

In trying to boost FDI, which would translate into wealth and job creation through citizenry participation and technological advancement, the FNDP[5] was developed to cover the period from 2006 to 2010. The plan's vision was a competitive export-led manufacturing sector that would contribute 20 percent to GDP by the year 2030. Its prime goal was to develop a sustainable, diversified, and competitive export-led value-adding manufacturing sector and to increase the share of manufacturing in total GDP from the current 11 percent to 15 percent by 2010. The plan's strategic focus was economic infrastructure and human resources development, and it targeted pro-poor growth-oriented sectors such as rural development, agriculture and manufacturing, which provided a greater opportunity for creating wealth and jobs, thereby rapidly reducing poverty. In this vein the FNDP[5] was expected to operationalise the Vision 2030 – of becoming "a prosperous middle-income nation by 2030". It also emphasised the creation of strong linkages between capital intensive sectors such as the mining, manufacturing and engineering, and the rest of the economy so as to enhance broad-based growth. The plan aimed in the long term to develop an open, competitive, dynamic, and sustainable manufacturing sector that was to be driven by the private sector as the principal actor, with emphasis on upstream and downstream manufacturing activities based on the mining and agro-industry sub-sectors. Consequently, one of the key targets of this plan was to create an enabling environment supportive of private sector growth and ensure that the country had good infrastructure such as roads, communication and energy supply, a supportive macro-economic environment and skilled human resource.

In order to enhance the manufacturing sector's growth the Government through the FNDP[5] focused on implementing the following specific interventions:

1) Structural Interventions:

a) Development and/or rehabilitation of infrastructure, especially feeder and all-weather roads and rail, and telecommunications.
b) Ensuring access to affordable modern technology by establishing technical exchange programmes with foreign countries.

c) Private Sector Development, especially relating to improving the business and investment climate by streamlining the establishment of business enterprises.
d) Rural industrialisation and irrigation development, by developing an appropriate infrastructure in rural areas so as to support small-scale manufacturing, targeting the processing of rural-based primary products and explore market opportunities for rural manufactured goods. Also to establish linkages between farming blocks, industrial estates, and out-grower schemes in order to set up industries close to the raw material source, and promote the use of alternative and renewable sources of energy, such as solar power.
e) Strengthening the financial sector and provision of affordable micro-finance particularly to MSMEs by establishing the Citizen Economic Empowerment commission (CEEC).
f) Improvement of the regulatory frameworks and establishment of multi-facility economic zones (MFEZs) in order to enhance both export and locally-oriented manufacturing industries.

2) Macro-economic Interventions:

a) Inflation and interest rate reduction, a stable and competitive exchange rate.
b) Transparent debt contraction and management.
c) Effective public expenditure and revenue management.
d) Sound economic governance and transparency.

Policy adjustments to support manufacturing sector were made and included repealing the Investment Act of 1993 and replacing it with the Zambia Development Agency (ZDA) Act of 2006. The ZDA Act of 2006, which was later amended in April 2009 (No. 5 of 2009), sought to revise the law relating to direct investment in Zambia, so as to provide a comprehensive legal framework for direct investment in Zambia, hence creating a more investor-friendly environment. The Act emphasised on fostering economic growth and development by promoting trade and investment in Zambia through an efficient, effective and coordinated private sector-led economic development strategy. One of its functions was to monitor and evaluate the activities, performance and development of enterprises operating in the MFEZs and industrial

parks (IPs). It also prescribed and enforced measures for the business or activity carried out within a MFEZ or an IP so as to promote the safety and efficiency of its operations.

2.2.1.3 The Sixth National Development Plan (SNDP[6]), 2011 – 2015

The Sixth National Development Plan (SNDP[6]) succeeded the Fifth National Development Plan (FNDP[5]), targeting the actualisation of the aspirations of Vision 2030 of becoming "a prosperous middle-income nation by 2030". While the FNDP[5] set the pace for improving economic infrastructure and investing in human resources development, the SNDP[6] seeks to build on the gains of the FNDP[5]. During the FNDP[5] period, the economy attained macro-economic stability and continued economic growth through infrastructure development. Despite the gains, the reductions in unemployment and poverty levels were not significant.

The objectives, strategies and programmes of the SNDP[6] include; accelerating infrastructure development, economic growth and diversification, expanding the industrial base and increasing value addition by facilitating the development of MFEZs and IPs, promotion and facilitation of Private-Public Partnership (PPP) projects and Joint Ventures (JVs) between foreign and local investors. Other objectives include, facilitating private sector development by promoting investment in infrastructure, providing incentives to facilitate technological transfer and promote private sector driven research and development (R&D) activities, promoting use of technology to enhance total factor productivity (TFP) and competitiveness through the establishment of sub-sector technical centres. In line with its theme "Sustained economic growth and poverty reduction", the SNDP[6] focuses on policies, strategies and programmes that will contribute significantly to addressing the challenges of realising broad-based pro-poor growth, employment creation and human development, which is guided by the principles of accountability, decentralisation and efficient resource allocation.

2.3 Zambia's Manufacturing Industry

2.3.1 Overview of the Manufacturing Sector in Zambia

The manufacturing sector in Zambia accounts for about 11 percent of the country's GDP and has been growing at an average annual growth rate of 3 percent since 2006.

Growth in the sector is largely driven by the extractive sector such as agro- processing (food and beverages), textiles and leather sub-sectors. Secondary processing of metals is another main activity in the sector, including the smelting and refining of copper, and this has led to the manufacturing of metal products. Fertilizers, chemicals, explosives and construction materials such as cement are also produced in the sector. Other activities include wood and wood products and paper and paper products (CSO National Accounts, 2011). The manufacturing sector's profile is shown in Figure 2.1.

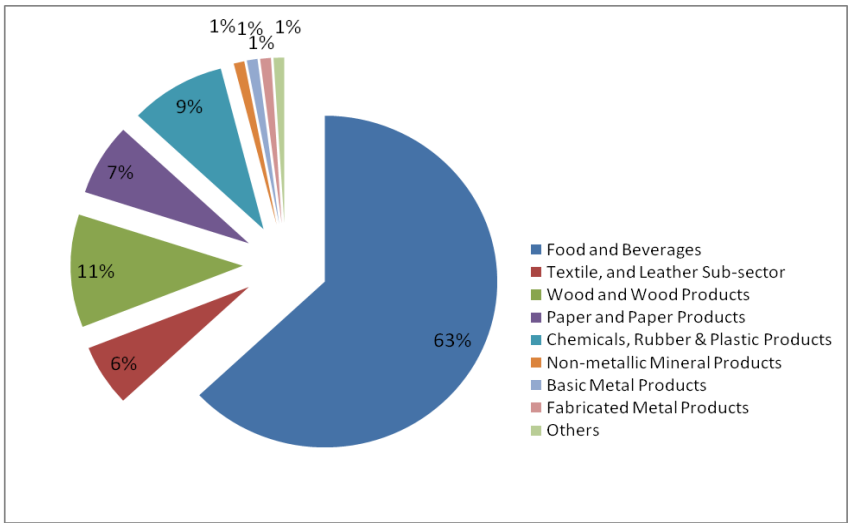


Figure 2.1: Composition of the Zambia's Manufacturing Sector

The manufacturing activities in the country are undertaken by the private sector with Government playing a facilitative role. The sector is of vital importance in relation to the country's macro-economic strategy for encouraging broad based economic growth.

2.3.2 Manufacturing Sector Categories

According to the United Nations (2008), Zambia's manufacturing sector is broken down into three main categories and one minor category as indicated in Appendix 1: International Standard Industrial Classification of All Economic Activities (ISIC) tables, namely; Primary or extractive industry, Secondary and Tertiary industries, and the Quaternary industry sector which comprises intellectual services such as law, finance, education, research, the media, computing, and information and communication technology (ICT).

2.3.2.1 Primary or Extractive Sector

This sector of the economy involves transforming natural resources into primary products, most of which are considered raw materials for other industries. This sector's industries are involved in procuring naturally-occuring resources and applying little processing or none at all. It is a genetic industry, which includes the production of raw materials that may be increased by human intervention in the production process, and extractive industry, including the production of exhaustible raw materials that cannot be augmented through cultivation. Major businesses in this sector include agriculture, agri-business, fishing, forestry and all mining and quarrying industries. The manufacturing industries that aggregate, pack, package, purify or process the raw materials close to the primary producers are normally considered part of this sector.

2.3.2.2 Secondary Sector

This sector of manufacturing often uses technology in the development and creation of goods. It includes industries that create a finished or usable product. It generally takes the output of the primary sector and manufactures finished goods or intermediate products suitable for use by other businesses, for export, or sale to domestic consumers. It is often divided into light and heavy industries. Examples include processed and refined foods, agro-processing like tobacco and tobacco products, leather industry, furniture and wood products, textiles, paper and paper products, rubber and plastic products (natural or synthetic) and manufacture of both alcoholic and non-alcoholic beverages and mineral water, fruit and vegetable juices and milk-based drinks. Other inclusions are automobile manufacturing like machinery, equipment, trailers and semi-trailers and other transport equipment, steel production and telecommunications, chemicals and chemical products, energy industry, industrial and electrical equipment, metal-working, gas, water and construction. Manufacture of coke and refined petroleum products, basic pharmaceutical products and pharmaceutical preparations are considered part of the sector.

2.3.2.3 Tertiary Sector

This sector of the economy, also known as the service sector, is defined by exclusion of the two other sectors. Services are defined in conventional economic literature as

'intangible goods' which include; attention, advice, experience and discussion. Tertiary industries involve the provision of services like transport, distribution and sale of goods from producer to businesses as well as final consumers. Examples may include banking, retail, insurance, transport and government.

2.3.3 Performance of Zambia's Manufacturing Sector

Zambia's manufacturing sector is confronted with competitiveness challenges that reflect partly technological incapability and partly the advancing process of globalisation, emanating from advanced nations and are determined by innovation and productivity performance. The performance of Zambia's manufacturing sector in terms of value addition has been relatively low, despite availability of natural resources. This is attributed to stiff competition from regional and international trading partners, like South Africa, which provide substantial direct cash incentive payments for exporters, which also enjoy lower production costs, economies of scale and greater installed capacity utilisation (World Bank, 2009). The local enterprises that have survived, and the new ones that emerged, basically went into resource-based activities that provided some comparative advantage. The small- and medium-sized enterprises are involved in the production of either localised goods or low-income goods, such as food and wood processing, simple metal products and textiles, while others although registered as manufacturing entities are actually either completely or partially involved in trading activities. The export of manufactured products remains significantly low and undiversified (Yamfwa, 2001).

Mining and quarrying sector, dominated by copper provides critically needed inputs for agriculture and agro-chemicals for industrial manufacturing, electricity and energy industry and essential raw materials for the engineering and construction industries. Mining has been the prime mover of economic development in Zambia since independence, although there is a considerable untapped potential for agricultural development in cultivable land and water resources (CSO National Accounts, 2010).

Some of the studies that looked at the performance of the Zambian manufacturing sector include; Gulhati and Sekhar (1982), Hwedi (1987), McGrath and Whiteside (1989), Munankaampe (2000), Yamfwa (2001) and Hamweendo (2006).

1) Gulhati and Sekhar (1982) endeavored to come up with a general analytical view of the industrial development sources of growth and/or decline in the economies of Kenya, Tanzania and Zambia from independence to early 1980s. It sought to assess the extent and nature of industrialisation in these countries, whose drive to industrialisation started on a promising note but faltered. It was viewed that the colonial legacy and the macro-economic climate influenced the economic performance of the said countries much more than the industrial reforms. The conclusion was that the dependence on the rate of rural development was the only stimulant of future industrial development of many African economies.
2) Hwedi (1987) looked at the state and development in Southern Africa. In his comparative analysis of Botswana and Mauritius with Angola, Malawi and Zambia, he examined and compared the role of the state in development in order to explain why states like Mauritius and Botswana were more successful developmental states than Angola, Malawi and Zambia. It was discovered that the secret to success laid on policy decisions and implementation. He concluded that state intervention was necessary to promote development. What was identified as paramount was the adoption of a positive development philosophy with a policy framework that leads through market mechanisms to efficient allocation and utilisation of public resources. This suggested that complementarity between the state and market forces had paved the way for the promotion of national development. Thus, the congruence between political systems and choices of economic policies is very vital.
3) McGrath and Whiteside (1989) considered the industrialisation and investment incentives in Southern Africa, Zambia in particular; where it was highlighted that FDI was generally attracted to the places where the returns were greatest and the risks lowest. The study indicated that the determinants of investment and industrialisation were more than incentives. The creation of the politically-stable climate with liberal allowances for the repatriation of profits by foreign-owned firms was cardinal. It was concluded that, if environmental factors were satisfactory, huge investment would take place in circumstances of guaranteed

markets through tariff protection and trade agreements such as SADC, PTA and COMESA among others.

4) Munankaampe (2000) analysed the performance of the manufacturing sector, particularly the engineering sub-sector. His recommendations were based on two initiatives; on one hand was the Government's need to embrace the PPP where it facilitated and formulated conducive policies for growth of industry through provision of certain financial and non-financial incentives such as reduction of import duty on raw materials and capital machinery, reduction in taxation, encourage partnership between foreign and local investors, while on the other hand the private sector was to take initiatives such as developing a culture of Research and Development (R&D) within the firm, investment into newer and more efficient technologies, improvement or modification of existing facilities for increased productivity and better use of cheaper but quality raw materials, and implement Total Quality Management (TQM) concepts to compete with imported products.

5) Yamfwa's study (2001) looked at improving manufacturing performance in least developed countries - a Case study of Zambia, with particular emphasis on firm-level improvement in food, textile, chemical and metal-working manufacturing firms. It sought to demonstrate the relevance of combining firm-level and sectoral analysis of manufacturing performance for the understanding of the dynamics of industrial developments and attempts to improve performance. His research presented an analysis of the impact of the enterprise's internal control factors and external influences on the firm's performance improvement from two fronts - sectoral and firm-level analyses.

   At firm-level, interesting findings showed that there was a huge disparity in transformation efficiency performance between the four industrial case studies subjected to the same national and sectoral influences. The growth of transformation efficiency and productivity was highest in companies that had relatively mass investment in capital assets in addition to sound policies and programmes implemented. Over the periods under review, that is; the period of expansion (1964 - 74), the period of slowdown (1974 - 91) and the period of

adjustment (1991 - 98), it was established that companies in developing countries were able to improve their performance through internal efforts even in depressed macro-environment. The efforts at firm level being exerted by managers while Government policies and interventions were directed at improving external influences relevant to a particular industry.

At sectoral level, the comparative analysis confirmed that there was a notable technology gap between Zambia and the productivity giant, the United States of America (USA), due to low capital intensity and relatively inefficient utilisation of factor output. It revealed that the performance of the companies was affected by the technological integration levels, orientation of the export markets, high levels of investment in machinery and equipment and the deliberate implementation of programmes to improve efficiency and quality. Based on the findings, he suggested that improvement of performance required effort and fresh investment into firm's assets and capabilities, and improved industrial and financial viability of the sector rather than through policies alone.

6) Hamweendo (2006), in his study "Cellular Manufacturing of Selected Copper Products in Zambia", attempted to examine the possibility of adding value to copper and increase foreign exchange earnings and savings by assessing the viability of processing copper locally into finished products using modern technologies like Group Technology (GT) and Cellular Manufacturing (CM). It was established that for as long as manufacturing firms used old technologies that do not add value to the blister copper or raw materials in general, imported products would be preferred at the expense of locally-made products because of their superior quality and lower prices.

However, none of the afore-mentioned studies touched on the MFEZ concept as it is a new concept and never existed then at least in the Zambian context. The proliferation of multi-facility economic zones globally has led to increased interest in the subject. Against this backdrop and the gap in particular this research was motivated.

2.4 The Multi-Facility Economic Zone (MFEZ) Concept

The MFEZs are specific geographic areas or premises with the highest quality of physical and special infrastructure where economic and commercial policies (tax and business incentives) are more liberal than in the rest of the country, with the sole aim of attracting more foreign direct investment typically by Trans-National Corporations (TNCs), in order to accelerate economic growth through technological transfer, job creation and increased foreign exchange earnings (Brautigam and Tang, 2011). However, this idea is not new as colonialists carved out such areas in their territories to function as regional trading hubs as early as the 19th century. These areas became free zones when the commodities circulated free of local prohibitions, taxation, duties, and excises, like the Greeks' Island of Delos in the Cyclades which is considered as the first approximation of a free zone (BC 167), in the sense that it provided free-trade-like conditions. In Asia, these zones were referred to as Special Economic Zones (SEZ), and the country to have utilised SEZs most successfully in the last thirty years is China (Farole, 2011).

There is a distinction between a SEZ and an "industrial or high-tech park". A SEZ is a comprehensive laboratory in which fully-fledged economic reforms can be piloted, while industrial or high-tech parks are a supporting component of SEZs, but with an industrial focus (Brautigam and Tang, 2011). In addition, SEZs are spatially delimited areas within an economy that function with administrative, regulatory, and often fiscal regimes that are different (typically more liberal) than those of the domestic economy. SEZs cover large administrative areas such as an entire province or a city while industrial parks generally encompass only part of a city. Farole (2011) states that "in terms of meta-denomination, the emerging consensus is that the term *Special Economic Zone* is both the broadest and the most precise to describe the zones defined here". In addition, it is particularly useful from a definitional and policy development perspective, as the component terms are themselves both sufficiently broad and precise (Farole, 2011):

1) *Special* refers to the differential regulatory regime that distinguishes the zone from the prevalent domestic economy;

2) *Economic* refers to the broadest type of activities now allowed in zones, without prejudice regarding their nature and focus; and
3) *Zone* refers to the physically or legally bounded "economic space" contained in the domestic territory.

A single SEZ can contain multiple 'specific' zones within its boundaries. The most prominent examples of this layered approach are Subic Bay Freeport Zone in the Philippines, the Aqaba Special Economic Zone Authority in Jordan, Sricity Multi-product SEZ and Mundra SEZ in India (World Bank, 2007). According to the World Bank estimates of 2007 there were more than 3,000 projects taking place in SEZs in more than 120 countries worldwide. The countries included were China, Mauritius, India, Malaysia, North Korea, Iran, Pakistan, Egypt, Tunisia, Republic of South Africa and Russia (World Bank, 2009). This huge growth occurred despite many zones having failed to meet their objectives; however, many others are contributing significantly to growth in foreign direct investment (FDI), exports, and employment, as well as playing a catalytic role in integration into global trade and structural transformation, including industrialisation and upgrading (Farole, 2011).

2.4.1 Examples of Successful Special Economic Zones (SEZs)

2.4.1.1 Special Economic Zones (SEZs) in China

Although SEZs concept first appeared in places like Puerto Rico in 1951, Ireland's Shannon Airport in 1959 and Taichung, Taiwan in 1965, mainland China is the world's foremost success story in using SEZs to build up industrial capacity (Graham, 2004; Knoth, 2000). The creation of SEZs played a strategic role in China's early economic reforms. Despite a slow start, these SEZs proved to be incubators for significant structural transformation. In 1979, four zones – Shenzhen, Zhuhai, Shantou and Xiamen were set up as experiments in the management of market liberalisation, and as magnets for FDI (Brautigam and Tang, 2011).

The Central Government of PRC only authorised seven SEZs, which are occasionally referred to as the "4+2+1", where (Brautigam and Tang, 2011):

1) "4" refers to the first group of SEZs that were authorised and established in the South-eastern coastal region of the country in the late 1979s - Shenzhen, Zhuhai, Xiamen in Fujian province, and Shantou in Guangdong Province. Shenzhen, in particular, grew from a fishing village to an industrialised metropolis within a generation. These four SEZs were quite similar in that they comprised large areas within which the objective was to facilitate broadly based, comprehensive economic development, and they all enjoyed special financial, investment, and trade privileges. The combination of favourable policies and the right mixture of production factors resulted in unprecedented rates of growth in the SEZs;
2) "2" refers to the new Pudong district in Shanghai and Hainan Island/Province. In 1988, the entire island of Hainan became a SEZ and in 1990, a large part of Shanghai, China's biggest city, was restructured as the Pudong New Area zone; and
3) "1" refers to the newly developed area of Tianjin Binhai, which was authorised in 2006.

Today China hosts more than 200 zones in a growing variety, focuses, and sectoral concentrations: free trade, economic and technological development, and high-tech industrial zones many of which nurtured clusters targeting a particular industry (Farole, 2011). China provides a reference for the use of wide area SEZs as a tool for economic growth, and it is expanding its model globally with investments in "economic co-operation zones" around the world. A summary of major SEZs in China is shown in Table 2.2.

Table 2.2: Summary of First Seven Major SEZs in China

SEZ/ YEAR BUILT/ORIGIN	OWNERSHIP	SUITABLE INDUSTRIES	COMPANIES	FOREIGN SHARES
Shenzhen/1979/ Small fishing village (2,000 km²)	TNCs, MNCs, SMEs, Sino-Foreign JVs & Foreign-Owned Strategic Alliances	Electronics, ICT, Automobile and parts, Textile, Leaf springs, architectural glass, Bio-technology/Pharmaceuticals, Construction Materials, Chemicals, Electronics, R & D, Instruments, ICT & Industrial Equipment	BYD, Dingoo, G5, Hasee, Huawei, JXD, Konka, Netac, Tencent,Skyworth, ZTA and Baidu. Taiwan's Hon Hai and CGS Holdings	0.28
Zunhai/1980/ Countryside	JVs, TNCs, SMEs, Foreign-Funded Firms	Automobile, Steel/Iron, Electronics, Bio-medical and Pharmaceutical machinery and equipment, Petrochemical, Raw Material Processing, R & D, ICT Equipment, Building/Construction Materials, Instruments & Industrial Equipment.	ExxonMobil, British Petroleum, Siemens, Carrefour and Matsushita, Texas Instruments	0.30
Shantou/1993/ 2.34 km²	Private Partnerships, SMEs, MNCs	Electrical appliances, Food-packaging, Cleaning, ICT, Toy manufacturing, Canning, Garments, Lithography & Plastics.	Philips, Samsung, AT&T, Hewlett Packard,	0.11
Xiamen/1980/ Countryside/ Island (1,565 km²)	SMEs, Equity JVs and Private Partnership, Contractual JVs	Rubber, Plastics, Quarry, Textile, Tanning, Chemicals, Machinery, ICT, R & D, Instruments & Industrial Equipment, Shipbuilding, Food processing, Tooling.	Hitachi, IBM, NEC, Olivetti, Toshiba, WAGO Corp	0.38
Hainan/1990/ Island (34,000 km²)	TNCs, MNCs, SMEs, strategic partnership, JVs	Machinery, farm equipment, textiles, Chemicals, Iron ore and Steel engineering.	Chongqing Qinglong, Mahindra, Miller Electric	0.25
Shanghai-Pudong/1993/ Fishing/ Farmland (522km²)	PPP, SMEs, Equity JVs, TNCs Private	Heavy industries Automobile, Petroleum, Chemicals, Textile, Biomedicine, ICT, Iron, Steel and Aluminium, Plastics, Electronics, Ship-building, Power station and agriculture.	Baostel Group , Jiangnan Shipyard, Volkswagen and General Motors	0.41
Tianjin Binhai ETDZ/2006/ Average City	TNCs, SMEs, Partnerships, Sino-Foreign, JVs	Plastics, Rubber, Textile, electronics, bio-pharmacy, Agriculture, clothing, metal products and	Intel, Canon, Nidec, Sanyo, Mitsubishi, Toshiba Pfizer	0.23

Source: Own (from data collected)

2.4.1.2 Success Factors in China's SEZs

Following further reforms by the PRC Government, SEZ status is largely irrelevant, as the whole country's economy has largely been "opened up". Since 1992, the State Council has opened a number of border cities, and in addition, opened all the capital cities of inland provinces and autonomous regions. So far 32 state-level economic and technological development zones, 53 new high-tech industrial development zones and 15 free trade zones have been established in large- and medium-sized cities. The strategy of implementing SEZs played a key role, as China became the world's largest exporter of manufactures and the leading recipient of FDI among emerging economies (Farole, 2011). As these SEZs adopt different preferential policies, they play the dual roles of "windows" in developing the foreign-oriented economy, generating foreign exchanges through exporting products and importing advanced technologies and of "radiators" in accelerating inland economic development (Brautigam and Tang, 2011).

According to Foreign Investment Advisory Service (FIAS) publication of 2008, SEZs normally are established with the aim of achieving one or more of the following four policy objectives:

i. To attract foreign direct investment (FDI): Virtually all zones programmes, from traditional EPZ to China's large-scale SEZs aim, at least in part, to attract FDI;
ii. To serve as "pressure valves" to alleviate large-scale unemployment;
iii. As experimental laboratories for the application of new policies and approaches: China's large-scale SEZs are classic examples. FDI, legal, land, labour, and even pricing policies were introduced and tested first within the SEZs before being extended to the rest of the economy; and
iv. In support of a wider economic reform strategy: The SEZs are a simple tool permitting a country to develop and diversify exports. For instance, SEZs of China; the Republic of Korea; Mauritius; and Taiwan, follow this pattern.

The evidence with respect to exports shows a much stronger role of SEZs. FIAS (2008) estimates that approximately US$850 billion in goods and services are exported

through SEZs in emerging and developing countries annually, which corresponds to nearly 20 percent of exports from these countries. Blanco de Armas and Sadni-Jallab (2002) state that in China, according to United Nations Conference on Trade and Development (2003), the share of FDI going into SEZs grew dramatically during the 1990s, reaching 80 percent of FDI, while in Mexico, *Maquiladora* operations accounted for 23 percent of FDI in 2000, up from 6 percent in 1994.

Furthermore, empirical research shows that many SEZs have been successful in generating exports and employment, and come out marginally positive in cost-benefit assessments. According to Jayanthakumaran (2003), cost-benefit analysis (CBA) using an updated enclave model shows that zones in China, Indonesia, Malaysia, South Korea, and Sri Lanka had economic internal rates of returns between 10.7 percent and 28 percent, "well above the shadow discount rate of the respective countries". Benefits were significant in relation to employment and taxes, and decreasing in relation to foreign exchange earnings, purchases of domestic raw materials, domestic capital equipment, electricity use, and domestic borrowing.

Johansson (1994) studied the catalytic role EPZs can play. Looking at Mauritius, the author proposes that the success of the zone originated in the fact that it combined foreign technical and marketing expertise with available domestic capital surpluses. Johansson (1994) makes the following conclusions:

i. EPZs may have a catalytic effect in the generation of an economy's "export supply response", this may be particularly important for low-income economies;
ii. EPZs can provide important training to labour toward industrial culture; and
iii. In the long term EPZs can provide a positive impetus to trade-related reform after having demonstrated the benefits of investment and trade, as happened in the newly industrialised East Asian countries.

A number of examples also illustrate the catalytic role zones play in processes of economic growth and adjustment processes (Johansson and Nilsson, 1997; Willmore, 1995). For example, many of the zones established in the 1970s and 1980s in East

Asia's "tiger economies" were critical in facilitating their industrial development and upgrading processes.

There are many essential factors that have contributed to the success of China's SEZs including the following:

1) Strong commitment and support of the government to pilot market-oriented economic reforms: Despite the high uncertainty at the beginning, the top leaders were determined to make changes, through a gradualist approach (Shen and Xu, 2011; Zeng, 2011). Such a determination ensured a stable and supportive macro-environment (Zeng, 2011). Moreover, Hong Kong, China has provided capital, logistical support, access to world markets, management know-how, technology, and management skills, while the Pearl River Delta region has provided labor, land, and natural resources. It is this interaction that has allowed the Greater Pearl River Delta region to emerge relatively quickly as one of the world's major manufacturing bases (Enright et al., 2005);

2) Land Reforms in China started from Shenzhen have played an important role in the SEZs' success. Since 1981, the government allowed SEZs to lease land to investors with an initial term of 20 - 50 years with the possibility of renewal. Meanwhile, a land auction system was established for all the commercial land (2002) and industrial land (2007) to ensure the efficient use of land resources (Shen and Xu, 2011);

3) Investment incentives and institutional autonomy: To encourage firms (especially FDIs) to invest in the zones, the SEZs had in place various fiscal and non-fiscal incentives and preferential policies, including streamlined administrative process, sound infrastructure, rapid customs clearance, concessionary tax rates, and flexibility in hiring and firing workers, among others (Ge, 1999; Enright et al., 2005). Favourable policies were also in place to attract skilled labour, such as the provision of housing, research funding, education subsidies, among others. In addition, the SEZs (especially the early-stage ones) were given greater political and economic autonomy. They had the

legislative authority to develop municipal laws and regulations to govern these zones. Such an unusual discretion allowed them more freedom in pursuing new policies and development measures deemed necessary to vitalise the economy (Zeng, 2011). Open Door policies coupled with generous incentives provided a greater opportunity for FDI to flow into China from the Chinese in diaspora, who have played important roles by attracting capital investment, technologies, and management skills; generating learning and spill-overs; and ultimately helping to build local manufacturing capacity (Zeng, 2011).

4) Technology innovation, learning, upgrading: One of the key strengths of the SEZs in China is that they have a high concentration of very skilled people, including many R&D personnel. In addition, the SEZs are closely linked to domestic enterprises and industrial clusters through supply chains or value chains (Zeng, 2011). The local government or industrial associations offer all kinds of technical and managerial training to enhance workers' skills. As a result, they have become centres of knowledge and technology generation, adaptation, diffusion, and innovation. This connection not only helps achieve economies of scale and business efficiency, but also stimulates synergistic learning and enhances industrial competitiveness (Zeng, 2012);

5) Innovative cultures: In developing the SEZs and supporting industrial clusters, the Government at all levels adopted many innovative approaches, such as public-private partnerships (PPPs), to address capital constraints (Zeng, 2011). For example, in the early stage of Shenzhen, joint ventures and private developers from Hong Kong, helped develop some basic infrastructure (Yeung et al., 2009). In the Puyuan sweater cluster in Zhejiang, the local government formed a shareholding company with 27 private logistics and transport firms to build the cluster's logistics centre (Ruan and Zhang, 2008). In addition to institutional flexibility, the composition of people in the SEZs also helped nurture innovation and entrepreneurship. Because most SEZs were built in new areas or suburbs of cities and were open to all qualified workers, they attracted a large number of immigrants from across the country and, later on, from

overseas, who hoped for better jobs and new opportunities. Such a strongly motivated migrant community tends to generate an innovative and entrepreneurial culture (Zeng, 2012); and

6) Location advantages: Most SEZs in China are located in the coastal region or near major cities with a history or tradition of foreign trading or business and thus are better linked to the international market. The location advantage is especially obvious for the SEZs in the Pearl River Delta region close to Hong Kong and the Min Delta region close to Taiwan due to good access to major infrastructure, such as ports, airports, and railways (Zeng, 2012);

7) Clear goals and vigorous benchmarking, monitoring, and competition: Despite the large number of SEZs in China, they all have clear goals and development plans that stipulate the expected targets for GDP growth, employment, exports, and FDI, as well as tax revenues (Zeng, 2011). The central government checks these targets almost every year, resulting fierce competition on performance among SEZs.

2.4.2 Overview of Chinese-Initiated SEZs Programmes in Africa "Going Global"

Over time, many African countries have launched various forms of SEZs programme such as export processing zones (EPZs), industrial development zones (IDZs) and MFEZs between the 1970s and 2000s, as illustrated in Table 2.3 (Farole, 2010). However, most of the programmes were not operationalised until the 1990s or 2000s, (Farole, 2011).

Table 2.3: Chronological Overview of SEZs Programmes in Africa

1970s	1980s	1990s	2000s
Liberia, Senegal, Mauritius	Djibouti, Togo	Burundi, Cameroon, Cape Verde, Equatorial Guinea, Ghana, Kenya, Madagascar, Malawi, Namibia, Nigeria, Rwanda, Mozambique, Seychelles, Sudan, Uganda, Zimbabwe	Gabon, Gambia, Mali, Zambia, South Africa, Eritrea, Tanzania, Mauritania

Source: Farole. T, 2010

In the mid-1990s, after nearly 20 years of "bringing in" (*yin jinlai*) foreign investment, technology and skills, the Chinese government began to emphasise "going out" (*zou chuqu*) or "going global." Going global involved finding new markets for Chinese goods and services, building up Chinese brand names, and ratcheting up China's own foreign investment (Farole and Akinci, 2011). In 2006, as part of the implementation of its eleventh five-year plan, and in keeping with the expansion of policies in support of trade and overseas investment, the Chinese government indicated that it would establish up to fifty overseas economic and trade cooperation zones (ETCZ) worldwide, without giving a timeframe (Brautigam, 2009). The Beijing summit of the Forum on China–Africa Cooperation (FOCAC) held in November 2006 pledged that three to five of these zones would be located in Africa.

It is clear that these zones were in part intended to fulfil "soft power" political goals, in particular demonstrating the efficacy of some aspects of China's development model and sharing it with friendly countries. Yet this is not the whole picture by any means. The zones were also intended to help China's own restructuring, allowing the labour-intensive, less competitive, "mature" industries, such as textiles, leather goods and building materials to move offshore (Brautigam and Tang, 2011). "Mature" industries are the opposite of "emerging" or "cutting-edge" industries. Garments and textiles, leather goods, simple plastic products are sub-sectors where few benefits can be gained from technological innovation and where competition is based more on costs. In an experimental fashion, the Chinese government and Chinese companies began to establish overseas industrial and trade zones, as early as 1998 (Brautigam and Tang, 2011).

2.4.2.1 China's Seven Trade and Economic Cooperation Zones (TECZ) in Africa

China has successfully implemented the SEZ programmes and offers many very useful lessons. However, these lessons must be carefully tailored into the local context of African countries, just as China did when it implemented its own SEZ programmes in the 1980s. China's Ministry of Commerce (MOFCOM) approved seven African zones for special funding under the "going global" initiatives; six had commenced construction as of November 2009 (Farole and Akinci, 2011). By mid-2010, such zones

as Chambishi in Zambia, Mauritius' Jinfei and Egypt's Suez Economic and Trade Cooperation Zones, Ethiopia Eastern Industrial Park, Nigeria's Lekki and Ogun-Guangdong Free Trade Zones were under construction in Africa, while the China Jiangling Free Trade Zone in Algeria had stalled because of unexpected changes in Algeria's legislation governing foreign investment (Brautigam and Tang, 2011).

Interestingly, the Sub-Saharan African countries where the official zones were to be built, have scored relatively well on the World Bank's "Doing Business" surveys. Mauritius, which is hosting one of the zones, ranks first in ease of doing business in sub-Saharan Africa, while Zambia ranks sixth, Ethiopia nineteenth, and Nigeria thirteenth out of forty-six countries. However, in the North Africa and Middle East region, Egypt ranks eleventh and Algeria fourteenth out of nineteen countries (World Bank, 2010). Some of the prospects and opportunities for African SEZs are discussed in the following section:

2.4.2.2 Prospects and Opportunities of the African SEZs

SEZs offer a combination of world-class infrastructure, expedited customs and administrative procedures, and (usually) fiscal incentives that overcome barriers to investment in the wider economy. SEZs have been used successfully in many developing countries (particularly in East Asia) to facilitate competitiveness, foster export-oriented production, and promote wider economic reforms (Brautigam et al., 2010). The China's SEZ experience offers many useful ideas and approaches for other developing countries, learn from or even replicate them. It must be emphasised that while foreign investment is particularly important, both for the additional capital, and for the new ideas and technologies it is assumed to bring, for the success of the zones, local investors also need unimpeded access to the zones, so that these new ideas and technologies can diffuse through local economies.

Anecdotal evidence suggests that relative success in African zones has been limited to a few countries, such as Mauritius, Kenya, Madagascar, and possibly Ghana (Watson, 2001; Farole, 2011). And Baissac (2003) suggests that with the exception of Mauritius, Tunisia and Egypt, African zones are marked by "marginal employment impact, low

FDI, absent linkages with the domestic economy, and limited foreign exchange contribution."

One vital point to note is that not all SEZs are created equal. Different countries present different opportunities and challenges. "There is no known 'model' that can be more appealing than another". However, when measuring the successes or failures of African zone programmes, it is important to consider that most African countries are relatively latecomers in implementing modern zone programmes and many of these zones are still in the early stages (Farole, 2011).

Collier and Page (2009) focus on the potential of SEZs as a form of spatial industrial policy, particularly for the African region. They argue that, by concentrating infrastructure and an attractive investment climate, SEZs can facilitate agglomerations that may enable African industries to overcome minimum size thresholds and begin to leverage scale economies.

Another most important criterion noted by all SEZ investors in both the African and non-African countries is access to reliable transport infrastructure. This relates not only to issues of location and hard infrastructure such as roads, rail and ports, but also to the soft infrastructure of customs and trade facilitation (Farole, 2011). According to Farole (2011), the access to reliable, competitively priced utilities was ranked as one of the most important investment consideration by firms in African SEZs. He concluded that where high-quality, reliable utilities are available, companies can deploy modern production techniques and ensure the efficient use of resources; where they are absent, costs rise, productivity suffers, and output is inconsistent.

As Farole (2011) shows, one of the key success factors for SEZs in Africa is for policy makers to work closely with the private sector to develop zone policy according to changing needs. Given the large investments required to support zones and their uncertain return in fragile situations, private sector participation is important to reduce risk in zone programmes. For instance, in Nigeria, many recent projects in the flagship zone in Calabar are Public-Private Partnerships (PPPs) between private developers and

government, while the country's Oil and Gas Free Zones are privately operated but publicly owned.

Brautigam and Tang (2013) conclude that several zones have made some good progress and began to show positive impact on the host countries, which is manifested in terms of levels of investments and employment in the following areas:

i. In the Zambia Chambishi MFEZ, 36 firms had signed contract and 26 were operational, with a total investment of US$322 million actual and over US$1 billion committed by July 2013. It employed 7,973 Zambian workers and 1,372 Chinese, including the mine workforce.
ii. The Nigeria Lekki Free Trade Zone had attracted US$76 million investment (US$700 million commitment) by July 2013. About 30 firms had signed lease agreements and 6 were operational. Among the 30 investors who signed contracts, 60% were Nigerians, 20% were Chinese, and 20% were from other countries including UK, India and Ukraine (Brautigam and Tang, 2013; Gabriel, 2012).
iii. The Ogun-Guangdong Free Trade Zone in Nigeria had attracted 34 investors who signed contracts, and 7 were operational, with actual investment of US$58 million and committed investment of US$150 million. As of June 2013, all the committed investors were private firms. They employed 1,619 African workers and 177 Chinese workers (Brautigam and Tang, 2013).
iv. In Ethiopia, all the factory shells in the Eastern Industrial Zone have been leased out with 12 investors, and one remarkable story is the Huajian Shoe Manufacturer from China, which has set up 2 production lines in the zone with a production capacity of 2,000 pairs per day, exporting to the US and European markets. It employs around 3,000 people, mostly local, and provides vocational training to its employees, including training of local technicians overseas.

Furthermore, UNIDO (2009) contend that if well-designed and well-located near universities, technology centres and ports, for example, SEZs can create dynamic

clusters even in very poor countries where the overall policies may not be optimum such as Mauritius.

2.4.3 Special Economic Zones (SEZs) in Mauritius

Having studied the success of export processing zones (EPZs) in East Asia, a group of visionary policy makers in Mauritius put forth the idea that the country's small economic size and distance from large developed markets presented a potential opportunity to develop an export-oriented textile industry (Zafar, 2011). Taking Chinese strategic considerations into account, Mauritius, among other East Asian neighbours, played host to a Chinese SEZ. The first formal export processing zones were established in sub-Saharan Africa in 1971, in Mauritius, and were widely regarded as a success (Vanessa, 2008b). Later, the island moved away from a mono-crop economy (although sugar cane still generates 25% of export-earnings), diversifying and creating profitable investment opportunities in export-oriented manufacturing, tourism, business and financial services. The Mauritius Export Processing Zone (MEPZ) is one of Africa's most famous and successful examples of the free enterprise type of EPZ, in which companies are granted status on an individual basis and are free to locate anywhere on the island, including in industrial parks that are not restricted to MEPZ enterprises (Baissac, 2010).

2.4.3.1 Jin Fei Trade and Economic Cooperation Zone (JFTECZ)

The island's first Chinese SEZ, the Jin Fei Trade and Economic Cooperation Zone (JFTECZ) is located in Riche Terre and covers 2.11 square Kilometres. About 0.75 square Kilometres area is operational by manufacturing firms in textile, garment and hi-tech, while the remainder is earmarked for machinery, trade and services (tourism, finance, education), and is expected to see an inflow US$720 million and create between 30,000 and 42,000 jobs (of which 8,000 will go to Chinese contractors) over the next 5 years (Brautigam and Tang, 2011). Once fully operational, the project is expected to generate about US$220 million worth of export earnings annually, thus creating a ripple effect on the entire economy. Headed by Taiyuan Iron and Steel Group, the Shanxi and the Tianli Group, commenced construction of another SEZ in Mauritius' capital, Port Louis, in late 2009. A second development phase of US$550

million is expected to be completed in 2016, and aims to focus on solar energy, pharmaceuticals, medical equipment, and processing of seafood and steel products, as well as housing, hotels, and real estate (Brautigam and Tang, 2011). In terms of share of GDP, goods produced in EPZs more than tripled between 1980 and 1988, from 4 percent to more than 14 percent. More people worked in EPZs than in the agricultural sector by the end of the 1980s. The growth rate of the EPZs value added was close to 30 percent annually between 1983 and 1988. Most of the goods produced in EPZs were exported to the EU under a preferential regime (Zafar, 2011). Currently, Mauritius has one of the most successful economies in Africa. Mauritius' EPZs account for 7.5 percent of GDP and 3.8 percent total FDI (http**://www.gov.mu),** in spite of being a small island, with a population of 1.3 million people of diverse racial and ethnic origins, Mauritius has enjoyed a high GDP per capita of US US$13,172 and a low unemployment rate of five percent. Mauritius is among the top-performing developing countries in starting a business, paying taxes, and protecting investors, and it has been a consistent reformer since it began being included in Doing Business in 2005 (World Bank, 2010).

Based on the success story scored so far by SEZs on the manufacturing performance in Mauritius, the Government of the Democratic Republic of Congo (DRC) is currently seeking help from Mauritius to develop an export processing zone (EPZ) in the Kinshasa district of N'Sélé which would be operative in 2012 and dedicated to agro-industries (http://www.gov.mu).

2.4.3.2 Success Factors in Mauritius SEZs

Among the critical factors identified for the performance of the zones in Mauritius include the following:

1) The Mauritian example is best referred to as a *zone-like* policy because it differed from the standard model in one crucial measure, where it allowed productive activities to function as export enclaves regardless of location within the country (Cheesman, 2012). In China and India, zone sites had been carefully chosen at the national level; the Mauritian zone policy did not specify available

locations in any way (Sawkut et al., 2009). In economic terms, the Mauritian policy was quite successful, as unemployment level dropped form 23% in 1979 to 2% in the 1990s and the nation's exports increased in both volume and diversity (Aggarwal, 2004).

2) Supply linkages: FDI has created both direct and indirect linkages for the local economy (Cheesman, 2012). Linkages are generally in the textile and garments sector, sugar and tourist sectors, while local links with domestic enterprises are in such activities as dyeing of fabrics, embroidery and sewing.

3) In order to improve the efficiency and international competitiveness of SMEs as an engine of regional growth for Africa, the following interventions were undertaken by the Mauritian Authority (UNCTAD, 2001):

    i. Creation of an Export Development Fund in 2000 to finance overseas marketing efforts of SMEs; and developing a supplier-linkage programme to upgrade SMEs in marketing relationships with foreign buyers;
    ii. Streamlining all bureaucratic procedures affecting SMEs such as company registration and financing; and
    iii. Establishing a gateway to co-ordinate the provision of business development services to SMEs such as consultancy services.

4) Cheesman (2012) notes additional success elements as diversified offshore services, with good regulatory and supervisory framework, political stability, strong legal institutions, bilingual workforce, quality of life and pro-business environment as well as well-developed physical infrastructures. Better still, Mauritian diaspora represent a very important pool of expertise that had been attracted back home to help jump-start the financial and business services, and the IT sectors, in the manner China, Taiwan, India, Singapore and Malaysia did.

2.4.4 Industrial Development Zones (IDZs) in the Republic of South Africa (RSA)

The Republic of South Africa has developed an established, diversified manufacturing base that has shown its resilience and potential to compete globally. (http://www.info.org.gov.za). As earlier discussed in the chapter, the attractiveness of any economic zone is characterised primarily by their association with the adjacent location of an airport or port, good basic infrastructure and duty-free imports of production-related raw materials and inputs to enhance the key export oriented focus of the zones. The South African Government adopted a special economic zone policy framework in 1997 as a catalyst to stimulate economic growth, export promotion and job creation (Chinguno, 2011). This was in line with the market-orientated macro-economic policy - Growth, Employment and Redistribution (GEAR) adopted in 1996 (Chinguno, 2011). Therefore, in 2001, Industrial Development Zones (IDZs) with tax and customs benefits were created in South Africa (DTI, 2008). The South African EPZs are called industrial development zones (IDZ) to reflect a stance against the labour-repressive regimes of typical EPZs (Chinguno, 2009). South Africa's IDZs are defined as "purpose-built industrial estates, linked to an international port or airport, specifically designated for new investment in export-oriented industries and related services" (CDE, 2012).

The establishment of the IDZs programme was aimed at raising the competitiveness of the manufacturing sector through "leveraging investment in export-oriented manufacturing industries and the export of value-added manufactured products" (DTI, 2008). Almost 10 years after they were introduced and billions of Rands of investment made, RSA's IDZ have enjoyed mixed success. Only two zones were operating and another three were starting to get off the ground, but on the whole they seemed to be attracting a good level of investor interest (Vanessa, 2008a). As indicated in Table 2.4, the five RSA's IDZs are Coega which was established in 1996 and the construction began in October 2002, East London, Richards Bay (2002), and OR Tambo Airport (2002). Moreover, two other zones, in Mafeking and Saldhana Bay have been designated for operation (Chinguno, 2011). Accordingly, four operators were issued

with IDZ Operator Permits by the Department of Trade and Industry (DTI) as follows (DTI, 2011):

1) The Coega Industrial Development Zone (CIDZ) (Driver, 1998; Luiz, 2003 and Chinguno, 2011).
2) The East London Industrial Development Zone (ELIDZ) (Chinguno, 2009; http://www.elidz.co.za).
3) The Mafikeng Industrial Development Zone (MIDZ) (Vanessa, 2008b).
4) Richards Bay Industrial Development Zone (RBIDZ) (Chinguno, 2009).
5) Oliver Tambo International Airport (ORTIA –IDZ) (https://www.thedti.gov.za).
6) Saldanha Bay Industrial Development Zone (SBIDZ) (Nel and Rogerson, 2013).

Table 2.4: Summary of Major IDZs in the Republic of South Africa

IDZ (Year) / LOCATION	OWNER-SHIP	SUITABLE INDUSTRIES	COMPANIES ESTABLISHED	DEVELOPMENT STATUS AS AT DECEMBER 2012
Coega (2001)/Near Port Elizabeth 11,500ha,	TNCs, MNCs, SMEs, JVs and Partnerships PPP	Heavy and light industries: Metals/Metallurgical Textiles: Flax; wool and mohair, Agro-processing, Automotive: OMEs, Components; Chemicals, Energy, Plastics, Electronics, Outsourcing, Aquaculture etc	Delta Corporation, Ford Volkswagen. Johnson and Johnson (J&J), Alcan and SEA-ARK. Suppliers; Goodyear, Corning, Bridgestone, Visteon, Hella, Faurecia, LUK and Johnson Controls.	Partially operational; under construction
The East London (September 2002)/ Buffalo City in the Eastern Cape: 430-hectare farmland	SMEs, Equity JVs and Private Partnership, Contractual JVs, PPP	Automotive and parts, Marine, Electronics, ICT Industrial Equipment, Textile, Leaf spring , architectural glass, Chemicals, R&D, Logistics, aquaculture, Bio-technology/ Pharmaceuticals, Construction Materials, agro-processing (bio-fuels, food and timber)	Mercedes Benz Hyundai/Kia, Nissan, DaimlerChrysler, Volkswagen, Ford, General Motors, Johnson Controls, Feltex, Venture, TI Automotive, Bodene, Carcoustics and MC Synchro, J&J, Aspen Pharmacare, CliniSut and Condomi. Aspen Pharmacare	Partially operational; under construction
Mafikeng (2003)/ North-West Province/ rural: 530-hectare farmland	PPP, SMEs, Equity JVs, TNCs Private and Equity JVs Buy-back arrangements, Partnerships	Automotive, Mining/Mineral beneficiation and Agriculture refinement, electronic components, wireless tracking and tracing equipment systems	Mafikeng Bio-diesel, Baro Bo-Raratshidi Mining, MC Synchro, Volga Atlantic, Aerotrade, Aersud, Air Logistics, Dobson International, UT Air, Kopano, Maximum, Calibrated Diamonds, AFBEA & the Pretoria University, and Royal Bafokeng Investment, Russian Technologies, Ferro Metals, Phakamisa Presswoods	Construction in progress 30% operational in Agricultural refinement and Electronics
Richards Bay (April 2002) /Tiny fishing village	TNCs, SMEs, Partnerships Sino-SME JVs, PPP	Mineral beneficiation, aquaculture, agro-processing, Chemicals, Textiles, Automotive: OMEs and component parts	BHP Billiton (Aluminum smelters), RB Minerals, Foskor, Tata Steel & Exxaro, Bell Equipment, TATA Steel, BEE engineering	345 hectares out of more than 1000 has developed industrial area
OR Tambo (2002)/ Ekurhuleni - Moderate city/Farmland	SMEs, Equity JVs, PPP	Mining/Minerals, Agriculture refinement, Chemicals, Instruments & Industrial Equipment, Jewellery, freight hubs	Pulp United, NCT Forestry, Prime Steel, Aerotropolis	Partially operational, Construction in progress

Source: Own (from data collected)

2.4.5 Prospects and Critical Success Factors of South Africa's IDZs

While it may still be too early to assess the prospects and overall effect of the IDZ programme on the South African economy, there appears to be a general cognisance that economic zones have played a vital role in stimulating the manufacturing sector. Due to non-accessibility of reliable empirical data for measuring the performance of the zones, evaluation of special economic zones has proved a challenge in Africa. Most literature on the impact of various economic zones has been largely focused on cases in China, and other East Asian and Latin American countries whose zones were created decades ago. In the case of South Africa's zones, there are a few authors such as Vanessa (2008) and McCallum (2011) who have investigated the impact of IDZs on the economy.

The five operational IDZs in South Africa have been evaluated and relatively poor performance noted, consequently, branding them to be failures, despite many positive gains being made by IDZs, in terms of the flow of FDI, job creation, GDP and export growth, and economic diversification. For instance, the East London IDZ had managed to better the Coega IDZ performance in attracting investors in 2006 and 2007 (Vanessa, 2008b). In the same vein, in 2007, the East London IDZ alone managed to create 1,313 direct jobs and the Coega IDZ an estimated 2,622 direct jobs. Further achievements of the ELIDZ include 23 on-site investors with investments estimated at R1.5 billion and an estimated total of 5,524 direct jobs (including construction jobs) created (Chinguno, 2009). By 2011, over 14 manufacturers had already taken up the opportunity of settling within one of South Africa's prime industrial estates as illustrated in Table 2.4 (https://www.thedti.gov.za). The afore-mentioned and other potential benefits of the zones are not automatic but are contingent upon whether the necessary conditions (critical factors) are created for their success or not, which include:

1) As indicated earlier, IDZs have had greater impact on manufacturing sector diversification (CDE, 2012). For instance, the ORTIA-IDZ has attracted investments in ICT, pharmaceuticals, tourism, mineral beneficiation, construction, agro – processing and creative industry (CDE, 2012).

2) The IDZs were intended to provide strong forward and backward linkages with the domestic economy (Chinguno, 2011). Forward linkages involve the economic activity between IDZs and local consumers, while backward linkages are those that exist between IDZs and local suppliers (Chinguno, 2009). Most of the agro-processing companies in the zones have strong backward and forward linkages with the domestic market, thus, creating more job opportunities (Chinguno, 2011).

3) Decentralisation and development of World-Class industrial infrastructure in areas where they did not exist, thus, enhancing job opportunities in the areas (Chinguno, 2011). Farroll (2011) elaborates that the clarity of the regulatory framework aids in addressing land issues, facilitating the provision of infrastructure, and ensuring compliance with the labour and environmental standards. And Ferguson and Ferguson (2009) suggest that the development of socio-economic infrastructure should not only facilitate the activities within the zones, but also the integration of the zones with the wider domestic economies.

4) World best practice has shown that consistent high level political commitment is critical for SEZs' success (Chinguno, 2011), as was the case in China (Farole, 2010). It has been discovered that SEZs tend to work where the strategic investment opportunities and desired industrial capabilities are clear (DTI, 2012), hence prompting the South African Government to review the general investor climate in the country (Chinguno, 2011).

5) A number of the investors (particularly the agro-processing) produce both for the export and domestic market (Chinguno, 2011), reflecting the primary and extractive industry which most African economies traditionally have comparative advantage on the global market. The key to successful exporting has its origins in the "new trade theory" which underlines the technical efficiency of firms (DTI, 2012).

6) A shift from import substitution approach to an export-led growth approach has been implemented in more recent years (McCallum, 2011). By increasing exports significantly and maintaining a steady and low level of imports, it is

clear that GDP is able to grow through the higher levels of net exports created (Froyen, 2009). In the context of Belassa (1978), the manufacturing sector in particular showed a strong correlation between GDP growth and net export growth, emphasising the role IDZs could play in creating GDP growth if they are able to successfully grow exports.

7) Regional skills strategies have to be developed and implemented to support the short, medium and long-term skills needs of industries within the zones and in the host regions. Furthermore, a capacity building programme is required to ensure that relevant government officials across the three tiers of government as well as senior executives of SEZs have the necessary skills and competencies to speed up implementation (DTI, 2012). There must be strong political and technical leadership, commitment over the long-term, integrated development planning and sufficient resourcing (DTI, 2012).

8) Productivity improvement, industrial clustering and business incubation programmes are critical for nurturing domestic enterprises, and facilitate their integration into key value chains in the zones and the regions (DTI, 2012). For instance, the Coega IDZ invites projects aimed at enhancing the clustering of industry within the zone, such as training and academic, metallurgical, electronic and technical and port clusters (http://www.coega.co.za). This initiative has advanced socio-economic development in the Eastern Cape region through skills development, technology transfer and job creation (Chinguno, 2011). Saldanha Bay IDZ has also proposed to have six principal clusters, namely; dry dock, oil and gas, mineral production, steel manufacturing, maritime building and repair, and renewable energy and production (Nel and Rogerson, 2013).

9) Proximity to the source of most raw materials and exit for finished products for export: Linked to the international deep-water port of Richard's Bay and with prime rail and road access, the RIDZ is indeed the portal to the world (www.gov.za). Due to its well-established industrial capacity and strategic central location, the MIDZ is a manufacturing hub for electronic components, wireless tracking and tracing equipment systems and services

(http://www.gov.za). For Saldanha Bay IDZ, its strength is based on its proximity to West and East African offshore oil and gas fields, and increased demand for engineering and marine vessel expertise.

Further evaluation of the country's IDZ programme indicates that it is premised on three economic objectives and rationale namely (Vanessa, 2008b); internationally competitive, attractive, and industrially synergistic (Porter, 1990).

2.4.6 Multi-Facility Economic Zones (MFEZs) in Zambia

Taking into account the importance of SEZs in testing and showcasing the success of economic reforms, the PRC's successful domestic experience on SEZs sheds more light on the concept and potential of SEZs for other developing countries such as Zambia, in designing its economic reform policies. In particular, PRC's experience indicates the benefits of open and market-oriented economic policies. Industrial development is viewed as an important objective for all economies which intend to grow and compete in global markets (Farole, 2010). By implementing comprehensive economic reforms, SEZs ultimately unify the industrialisation and urbanisation processes. In Zambia, the MFEZ is an extension of an EPZ, which became operational in January 2003, but later suspended due to revenue concerns, and their failure to leverage comprehensive forward and backward linkages between firms inside and those outside the zones (Stein, 2008). There are special fiscal incentives for investors in the MFEZ which can be accessed by both local Zambian and foreign firms to promote manufacturing, exports, technology development, skills transfer and job creation. The Multi-Facility Economic Zones are broken down into two types (ZDA Act No. 11, 2006):

i. Production MFEZs - ones for manufacturing related businesses;
ii. Export Trade MFEZs - ones for commercial trading, warehousing and many others to exploit export markets.

Basically, there are two ways of operating an MFEZ (ZDA's Statutory Instruments No. 27 of 2007):

i. Where a company desires to develop a multi-facility economic infrastructure; it is required to submit an application for a permit to develop a MFEZ and follow the guidelines as provided for in the MFEZs General Regulations. For instance, a textile operation in close proximity to cotton farms, could be considered a virtual zone and be subject to the same privileges as MFEZs; and
ii. Where a company desires to locate in a multi-facility economic zone so that it is granted the MFEZ status; it is required to submit an application for a licence to operate a business enterprise in the zone and follow the guidelines as provided for in the MFEZs General Regulations.

2.4.6.1 Objectives of the Multi-Facility Economic Zones (MFEZs)

According to the ZDA Act No. 11 of 2006 (Principal Act), MFEZs' objectives are as follows:

i. To attract domestic and foreign direct investment;
ii. To catalyse industrial and economic development through increased activities in the manufacturing sector where value addition to the numerous natural and agricultural raw materials which are exported in raw form will be processed for purpose of enhancing both domestic and export oriented business;
iii. To create and accelerate new economic growth poles through technology and skills transfer, job creation and increased foreign exchange;
iv. To enhance spatial transformation thus stimulating industrialisation in the economy; and
v. To enhance the competitiveness, factor productivity and economies of scale of Zambia's manufacturing industries.

2.4.6.2 Qualification Criteria to Locate in a Multi-Facility Economic Zone (MFEZ)

The legislation governing the MFEZs is main-streamed in the Zambia Development Agency (ZDA) Act No. 11 of 2006 under section 18, and Section 5 of the same ZDA Act mandates ZDA to administer, control and regulate MFEZs in Zambia. Any

investor, be it foreign or local qualifies to develop a Multi-Facility Economic Zone or operate in an existing MFEZ upon demonstrating that the investment will provide among other benefits, the following:

i. The level and attraction of local and foreign direct investment;
ii. The extent of skills development and transfer to local entrepreneurs and communities;
iii. The extent to which the project will lead to expansion of local production;
iv. The introduction and transfer of technology, and the production of new products;
v. The extent to which the project will lead to the diversification of the economy and increased foreign exchange earnings;
vi. The degree to which the project leads to import substitution and is export-oriented; and
vii. The amount and quality of local employment creation.

2.5 Location of Multi-Facility Economic Zones (MFEZs) in Zambia

The ZDA Act No. 11 of 2006 (Principal Act) states that an investor is free to identify and suggest any other location in the country deemed economical for such development. In addition, the regulations and guidelines governing the declaration and establishment of MFEZs were put in place through a Statutory Instrument No. 65 of 2007.

Presently, the construction of the production MFEZs is underway in Chambishi, Lusaka, Ndola and Solwezi towns, although the Government has also prioritised certain areas for the development of such zones in Mpulungu, Chembe, Nakonde and Kasumbalesa (http://www.mcti.gov.zm/index.php). A summary of proposed MFEZs in Zambia is shown in Table 2.5, while their profiles and locations are illustrated on the Map of Zambia in Appendix 1.

Table 2.5: Summary of Major Production MFEZs in Zambia

MFEZs/IPs	GEOGRAPHICAL LOCATION	OWNERSHIP OF FIRMS IN MFEZs/IPs	SUITABLE INDUSTRIES	DEVELOPMENT STATUS AS AT DEC 2013
Chambishi/ Forest Reserve	Copperbelt: Chambishi - 12° 39′ 0″ South and 28° 04′ 0″ East of GMT	TNCs, MNCs, SMEs, Sino-Foreign JVs & Strategic Alliances	Copper and copper related industries, agro-, household appliances, motor parts, explosives	Partially operational, under Construction; Chambishi Smelter, BGRIMM Sino Metals/Acid, REBA
Lusaka East/ Sub-Zone/ Forest Reserve	15° 20′ 0″ South & 28° 24′ 0″ East. Near Kenneth Kaunda International Airport	SMEs, Equity JVs and Private Partnership, Contractual JVs	Copper related industries, food, garments, electric, electronic, Car and bicycle assembly	Construction Stage (access roads done)
Lusaka South/ Forest No. 26, 2,100 hectares	15° 30′ 0″ South and 28° 22′ 0″ East Chifwema Rd, 1.8 km off Leopards Hill Rd	PPP, SMEs, Equity JVs, TNCs Private	Food, garments, ICT, appliances, tobacco, beverages, research, Agro, diagnostic/medical	414 hectares on Eastern side of zone developed; two phases remaining
Lumwana/ Forest Reserve (1, 300 ha)	11° 50′ 0″ South and 25° 08′ 13″ East, South-east of T5 road	Equinox-owned company- Lumwana Mining Co.	Explosives, fishery, agro, construction, electrical/electronics, chemicals, machinery hospitality	Construction Stage (60% residential areas done)
Sub-Sahara Gemstone Park/Trade Fair ground	13° 01′ 20″ South and 28° 39′ 28″ East along Crompton road off Kabwe Rd	SMEs, Equity & Contractual JVs, Private Partnerships	Lapidary, plastic, paper pulp, non-ferrous metals, wood, electro-winning & brick manufacturing	Partial operation and on-going construction
Roma Park/ 104 ha La Soleil Farm	15° 23′ 0″ South and 28° 18′ 0″ East of GMT	SMEs, Equity JVs & Private Partnership	Manufacturing, real estate, commercial and retail service sectors	Construction Stage

Source: Own (from data collected)

2.5.1 Chambishi Multi-Facility Economic Zone (CMFEZ)

The China Nonferrous Metal Company (CNMC) own both Chambishi MFEZ and Lusaka East or Sub-zone, which are managed by the Zambia-China Economic and Trade Cooperation Zones (ZCCZ) under the authority of The Forum on China–Africa Cooperation (FOCAC) (Brautigam and Tang, 2011). In 2003, CNMC began planning the construction of the Chambishi MFEZ located in Zambia's Copperbelt region, about 420 kilometers North of the capital of Lusaka. It is geographically located 12° 39′ 0″ South of the Equator and 28° 04′ 0″ East of Greenwich Mean Time (GMT), as shown in Appendix 2. CNMC's decision to open a zone for mineral processing and related

industries allowed the company to make full use of the 41-square kilometre surface area of its Chambishi Copper Mine.

The Chambishi MFEZ is expected to accommodate heavy and light industries, among them cobalt and copper value chains, agro-processing, manufacture of copper cables and plant machinery and parts, recycling, household appliances, metal bars, wires and motor parts (http://www.mcti.gov.zm/index.php). So far, the notable developments that have taken place are the development of the Chambishi Copper Smelter (refer to Appendix 2), and a road network to the site. The main water pipe lines from Kafue River to the zone, and the power substation have so far been constructed (http://www.mcti.gov.zm/index.php). According to Brautigam and Tang cited in Farole and Akinci (2011), the zone aims to attract 50 to 60 enterprises, create more than 6,000 jobs for Zambians, and reach an annual output of more than US$1,500 million by 2011. In the Chambishi MFEZ, 36 firms had signed contract and 26 were operational (most of them are actually subsidiaries of the zone developer), with a total investment of US$322 million actual and over US$1 billion committed by July 2013. It employed 7,973 Zambian workers and 1,372 Chinese, with the majority working in the mines or at other CNMC subsidiaries (Brautigam and Tang, 2013). Among the operational companies in the zone apart from NFC African Mining PLC are:

i. Chambishi Copper Smelter Limited owned by the Chinese investors, processes copper ore and cobalt mined in Chambishi, Luanshya and outside areas into blister copper and polished cobalt respectively, for export. It will now be processing these metal ores for domestic market for further value-addition.
ii. Sino Metals Leach (Zambia) Limited's line of work is foundry and forging, which involves manufacture of pre-formed metals and metal bars or plates for the fabrication and construction industry. This firm is also owned by the Chinese investors.
iii. Sino Acid Products (Zambia) Limited, owned by Chinese nationals will be manufacturing Sulphuric acid in particular from the trapped sulfur dioxide emitted during copper production. This same acid is used as an electrolyte in the copper production.

iv. The Chinese-owned BGRIMM (Beijing General Research Institute of Mining and Metallurgy) Explosives Plant which is a major supplier of explosives for Chambishi mine and other copper mines in Zambia is constructing an explosive plant in the zone.
v. REBA Industrial Corporation, which is owned by Chinese investors, will be manufacturing machinery plants, components and parts for the mining, industrial and agricultural use. At the moment, there are only assembly operations for the machinery and implements going on.
vi. Zambia Non-ferrous Metals Explorations and Construction Limited (ZNMEC), established in 2011, currently it provides exploration services to the mining and construction industries.

Other investors who have been approved to set up business in the Chambishi MFEZ include:

i. Chambishi Foundry and Rolling Steel Limited;
ii. Fifteen MCC Africa Construction and Trade Limited;
iii. Twapalwa Industrial Corporation Limited;
iv. Golden Honesty Africa Development Limited;
v. Limian Service Limited;
vi. Bolo Mining Investment Limited;
vii. Sintra Company Limited;
viii. Afri-Zam Timber Limited; and
ix. China Chemical Engineering Zambia Limited.

Due to the growing activities in the zone, CNMC plans to construct a hospital within the zone, which will cater for the population in and around the zone. Other four companies that have so far signed agreements with the Zambia-China Economic and Trade Co-operation Zone (ZCCZ) for them to start operating at the Chambishi MFEZ with investment pledges of over US$100 million are the Shangdong Guanfeng Seeds Technology Company Limited, Guanfeng Group of China, Xiang Guang Group and Yanggu Xiangguang Copper Company Limited.

2.5.2 Lusaka East or Sub – Zone

The construction of the Sub-Zone, which is an extension of the Chambishi MFEZ commenced in the last quarter of 2009 by the CNMC Group. The CNMC's Lusaka Sub-zone's planned area is 5.7 square Kilometres, and it is located 25 Kilometres North-east of the City in the Lusaka East Forest Reserve, adjacent to the Kenneth Kaunda International Airport, on geographical coordinates of 15° 26′ 0″ South of the Equator and 28° 24′ 0″ East of GMT (see Appendix 3). About K20 billion was allocated for the construction of access roads to the Lusaka East zone (http://www.mcti.gov.zm/index.php). The establishment of this zone was meant to attract the state-of-the-art technology into the country. The strategic purpose of the Sub-zone is to diversify out of resource-intensive investment as well as to accommodate the Zambian government's desire for urban employment opportunities. China Development Bank has set up a Zambia team to provide funding support for the zones and CNMC activities in Zambia (Farole and Akinci, 2011). The zone is expected to house light manufacturing activities like food, garments, electronics and electric appliances, assembly plants for automotive and other movable equipment, tourism, agro-processing, brewery, pharmaceuticals, building materials and services such as bonded warehouses, provision of conference facilities and hotel accommodation, among others (http://www.zda.org.zm). In 2011, the China-Nonferrous Mining Company (CNMC) under the ZCCZ Lusaka Office, which is responsible for the investment, operation and management of the Co-operation Zone, embarked on promoting Solar-power consumption plants such as the solar batteries, panels and inverters. The phase I of the completed area is about 1.6 square Kilometres.

2.5.3 Lusaka South Multi-Facility Economic Zone (LS-MFEZ)

The Lusaka South MFEZ located approximately 10 Kilometres from the Lusaka City centre and 21 Kilometres from the Kenneth Kaunda International Airport in the de-gazetted Forest No. 26, is being spearheaded by the Zambian Government through the Ministry of Commerce, Trade and Industry, with the help of the JICA, Malaysian and Japanese investors under the Public Private Partnership (PPP) policy framework (Farole and Akinci, 2011). This MFEZ is located on 15° 25′ 0″ South and 28° 17′ 0″

East coordinates (Appendix 4). The Lusaka South MFEZ whose Master Plan was developed by Kulim Hi Tech Cooperation of Malaysia, the Japanese Experts and the Local Expert Team will house a variety of industries and facilities, among them; light and heavy manufacturing process such as garments, appliances, food, tobacco and electronics, research and development, commercial, residential, golf course, institutions and community facilities with total investment flows expected to exceed US$ 1.2 billion (http://www.mcti.gov.zm/index.php). It is reachable through two inlets and exits, namely the Chifwema Road about 1.8 Kilometres off Leopards Hill Road and Mosi-Ou-Tunya Road. The total area coverage of this site is about 2,100 hectares.

The LS-MFEZ is a public sector led commercial project through which the Government of Zambia is providing hard and soft infrastructures to support the development of the private sector. It is planned and established with a strong public sector participation involving ZESCO Limited, Zambia Telecommunication Corporation (Zamtel), Lusaka Water and Sewerage Company (LWSC), Road Development Agency (RDA) and Industrial Development Corporation (IDC). The LS-MFEZ is the Special Purpose Vehicle (SPV) established in June 2012 by the Ministry of Finance (MoF) to manage, operate and develop the zone, while the promotion and marketing of the zone will be done jointly by ZDA and the LS-MFEZ (http://www.mcti.gov.zm/index.php). The LS-MFEZ owns the assets of the zone and raises the necessary equity and debt finance for development through (http://www.zda.org.zm):

i. The land value, cost of the Master Plan, and other preparatory costs invested by GRZ to date;
ii. Initial equity injection by suitably qualified private sector investors. Any debt raised by GRZ from cooperating partners would be leased to LS-MFEZ on terms that ensure the viability of the Lusaka South.

According to Statutory Instrument No. 47 of 2010 of the ZDA Act, the types of industries that are allowed to operate in the Lusaka South MFEZ include:

i. High-Tech industries;

ii. Research and development (R&D) institutions;
iii. Electrical and electronic appliances;
iv. Agriculture and agro-processing;
v. Pulp and packaging boards;
vi. Packaging and printing;
vii. Diagnostic, professional, medical, scientific and measuring services;
viii. Information and Communication Technology (ICT);
ix. Gemstone processing; and
x. Education and skills training institutions.

The construction of the Lusaka South MFEZ is in five phases. Phase 1 commenced with the development of 414 hectares of land on the eastern side, as it was closer to the already existing access roads which were easily upgraded and proximity to the water source and storage (Chalimbana River). In addition, it was easy to extend the existing communication duct and a power sub-station located in Woodlands to the eastern side of the site (http://www.mcti.gov.zm/index.php). Once completed, Phase I is expected to employ up to 4,800 workers. Indians, Malaysians and some Zambians have expressed interest in investing in the Lusaka South MFEZ. This will be another base for creating a new industrialisation drive in Zambia. JICA whose goal is to make Zambia a model for investment promotion that other African countries can emulate, had completed the feasibility studies in 2011, and the construction of the ring roads to connect to the Lusaka South MFEZ is expected to commence in the second quarter of 2013 (http://www.zda.org.zm).

2.5.4 Lumwana Multi-Facility Economic Zone

Lumwana MFEZ covers 1, 300 square Kilometres area of land and would focus on light and heavy industries. Geographically, it sits on 11° 50′ 0″ South and 25° 08′ 13″ East, South-east of T5 road (refer to Appendix 5). Lumwana Property Development Company Limited, as the developers of this MFEZ have prepared a Master Plan and plans to invest US$ 1.2 billion for development of the MFEZ whilst creating 13,000 jobs. Some notable activities that the LMFEZ houses and expects to house include

manufacture of explosives, petrochemicals, construction, agro-processing, horticulture, fisheries, and hotel accommodation among others (http://www.mcti.gov.zm/index.php).

Lumwana MFEZ is a brain child of the Equinox-owned company, Lumwana Mining Company (LMC), following the Government's decision to sign a Statutory Instrument (SI) for the operation of the LMFEZ. Equinox Minerals Ltd is an international mining company that is dual listed in Canada and Australia on the Toronto Stock Exchange and the Australian Securities Exchange, respectively. By virtue of the zone being near the DRC and Angola, it is expected to increase trade integration with the two neighbouring countries and generate substantial amounts of foreign exchange. The company projected that up to US$50 million will be invested into the zone by various companies which have shown interest such as Hitachi Limited. This Japanese company is to invest about US$10 million in setting up an electrical and electronics machinery manufacturing plant. Canadians, South Africans, Japanese and Europeans are also eyeing to pump in their investments in the Lumwana MFEZ

2.5.5 Sub-Sahara Gemstone Exchange Industrial Park

The Sub-Sahara Gemstone Exchange Industrial Park (SSGEIP) is a Multi-Function Economic Development Zone located in Ndola, Copperbelt Province along the Ndola-Kabwe Road and approximately 10 Kilometres from Ndola Central Business District (CBD). It is adjacent to Indeni Oil Refinery and 4 Kilometres from Simon Kapwepwe International Airport (former Ndola International Airport). It is being constructed, developed and managed by Phoenix Materials Limited, a wholly Zambian-owned construction and development company (http://www.mcti.gov.zm/index.php). SSGE Industrial Park aims to be a modern multi-function economic development park with a variety of facilities including; oil refinery, light manufacturing for plastic products, non-ferrous metal products, pulp, paper, and wood products, metal-ware, MSMEs, container depot and dry port, high quality multi-functional manufacturing warehouse facilities and Logistics Centre. Other support facilities will be skills training and business incubators (BI), procurement services, shopping mall, office parks, hotel and residential developments.

The aim of the park is to create a streamlined export procedure that will assist buyers, sellers and producers of rough and processed gemstones and jewellery to freely participate and conduct regular auctions and routine transactions, thereby making gemstone mining a sustainable venture to bring wealth to the nation as a whole. This happens to be the first industrial park being developed by Zambian entrepreneurs. The industrial park is expected to house more than twenty companies and create more than 4,000 jobs. The park is situated in Ndola on a 100-hectare piece of land on the Kabwe – Ndola Road (http://www.mcti.gov.zm/index.php). It is geographically situated on 13° 01′ 20″ South and 28° 39′ 28″ East of GMT, along Crompton road which branches from Ndola – Kabwe Road (refer to Appendix 6). The park enjoys developed premises previously owned by Ndola Precious Metals. The developers of the Industrial Park have already invested US$ 8 million in rehabilitating infrastructure and have so far attracted three (3) enterprises engaged in manufacturing and processing activities.

The establishment of the Sub-Sahara GEIP is demand driven. It is meant to carry along local entrepreneurs in meeting economic trends in response to prevailing domestic economic conditions. This initiative arose upon the realisation that, although Zambia is one of the three major gemstone producers in the world it had not established a formal gemstone market. The park is, thus, meant to organise and create a market for gemstones in Zambia (http://www.mcti.gov.zm/index.php). The park intends to be a one-stop shop for buyers and sellers, a place where gemstones would be polished at the lapidary, graded, tested for defects at the gemology laboratory and eventually exchanged or auctioned at the exchange centre. The gemstone exchange will increase transparency and maximise profits, which in turn will lead to wealth creation and contribute to national development. Some South Africans and Indians have expressed interest in investing in this park (http://www.mcti.gov.zm/index.php).

2.5.6 Roma Industrial Park

Situated on 104-ha area of virgin land, formerly La Soleil Farm, along Zambezi road 20 Km North-east of Lusaka (Roma Suburb), Roma Industrial Park aims to bring to fruition the investment requirements of all potential investors. Geographically, it is situated on 15° 23′ 0″ South of the Equator and 28° 18 0″ East of GMT (refer to

Appendices 7). The objective of the Roma Industrial Park is to be a 'Turn Key' medium that provides all-encompassing services alleviating any bureaucracy in foreign and local investment. The Roma Industrial Park is poised to be the next largest private mixed development in Zambia and Southern Africa region providing world class investment opportunities across light manufacturing, real estate, commercial and retail service sectors. Once fully developed, Roma Industrial Park will have 15, 000 square metres of light industry and warehouse space, 15, 000 square metres of retail space, 500 housing and residential developments, restaurant and conference facilities (http://www.mcti.gov.zm/index.php).

Founded by CPD Properties Limited in 2008 in the Roma Suburb of Lusaka, Zambia, and owned by a South African company, Interspan Sales Corporation, the park today operates and provides a diverse portfolio of commercial investment properties providing world class amenities which include shopping malls, office space, residential estates, warehousing space as well as specialised and secure light manufacturing units. The park will also promote local business development through the creation of an incubator for MSMEs. The total project cost is estimated at US$ 46 million with projected employment levels estimated at 2,800 employees (http://www.reiz.co.zm). Some South Africans and Zimbabweans have expressed interest in investing in the Roma Industrial Park. For light manufacturing, the Roma Park will provide purpose-built and well serviced manufacturing units in a well secured area that is strategically positioned close to the railway line and has good road networks to countries such as Malawi and the Democratic Republic of Congo. These manufacturing units are well designed to cater for the needs of its occupants with office space, ample parking space and floor space. The developers will also offer a flexible range of warehousing facilities which can either be procured or leased by respective clients. A substantial portion of land has been dedicated to modern warehousing facilities which will offer short and long term storage with pick and pack capabilities. The warehouse facilities have the added advantage of being near transport links such as the Great North railway line and the Kenneth Kaunda International Airport.

2.6 Special Economic Zones and Domestic Industry Integration

The previous section discussed the SEZs and how this phenomenon can be employed to spur economic development in host countries, by discussing critical factors and key determinants for their success. This section looks at the creation of business linkages among industrial players in the economic zones, and the internationalisation of the Micro, Small and Medium-scale Enterprises (MSMEs). It explores the theory of absorptive and innovative capacities of firms, and the mechanisms for diffusion of technology and skills in the SEZs.

2.6.1 Fostering Industrial Linkages and Synergies in Special Economic Zones

Literature suggests that SEZs or MFEZs advocate for the formation of *business linkages* between the TNCs and the local firms through *industrial clusters* in collaboration with other industrial stakeholders like Government's agencies as well as the research organisations (UNCTAD, 2006). The undertakings of IDZs are expected to create linkages between them and local firms in the economy (Kusago and Tzannatos, 1998). As stated by Cheesman (2012), literature on linkages and economic development contains two main strains which are relevant, namely; Hirschman's foundational work (1958) on the definitions of linkages on one hand, and the effects of foreign investment on the generation of linkages on the other hand. Hirschman (1958) defines business linkages in two ways; as either *backward* or *forward*, depending on the direction of the movement of goods or services along them. "*The input-provision, derived demand, or backward linkage effects, will induce attempts to supply through domestic production the inputs needed in that activity;* and, *The output-utilisation or forward linkage effects, will induce attempts to utilise its outputs as inputs in some new activities"* (Hirschman, 1958). Linkages are key to Hirschman's overall concept of economic development. His is a model of unbalanced growth – implying that, he supports the potential for an underdeveloped economic system to grow and develop in spite of structural deficiencies, so long as linkages between and from important sectors are allowed to function freely (Hirschman, 1958). The linkages are identified as a key component of the developmental effect of the special economic zone (Hirschman,

1958). These linkages programmes can take different forms depending on the objectives the Government wants to achieve, which include (UNCTAD, 2006):

i. *Forward linkages with customers* that allow marketing outlets to be outsourced, and through which affiliates may form linkages with industrial buyers through added-value after-sales services.

ii. *Backward linkages with the suppliers* that offer new market opportunities for local firms when the TNCs purchase components, materials and services locally. Such linkages can range from arm's length market transactions to long-term inter-firm relationship.

iii. *Linkages with competitors* through which TNCs may set new standards for local firms to compete with.

iv. *Linkages with technology partners* through which some TNCs may initiate common projects with indigenous MSME partners, including joint ventures, trade, licensing and strategic alliances that are a potential source of technology and know-how for companies in the host economy.

By and large, the good practices in developing TNC-MSME linkages would include UNCTAD (2006):

i. Encouragement, initiation and support of linkage-promoting programmes;
ii. Facilitating and providing funding and access to markets;
iii. Providing feedback, coaching and mentoring;
iv. Encouragement of human development and contribution to technology transfer;
v. Support of clustering, networking and other forms of cooperation; and
vi. Support of exporters, agricultural producers and gender balance.

Linkages created would integrate the zone into the regional and national economy, promoting regional development beyond the immediate zone structure. Eventually domestic suppliers would be able to compete in the international market (Madani, 1999). High volumes of trade and activity by local firms also provided other benefits,

such as large employment and technological spill-over effects (Madani, 1999). Froyen (2009) further suggests that successful forward linkages increase consumption by local consumers which in turn increase GDP. Farole and Akinci (2011) intimate that gradual interaction of the SEZs with domestic firms, notably through backward linkages and labour circulation, can increase a domestic firm's capabilities to compete, if the business climate outside the SEZs is gradually reformed. For instance, countries such as the Republic of Korea, China and Ireland (Shannon) have used fixed-term non-renewable two- to five-year contracts for local managers in SEZs. Consequently, because of a strict labour policy as well as voluntary departure, many employees left SEZs to create rival firms (Callanan, 2000; Jenkins et al., 1998; Leong, 2007). White (2011) further states that getting SEZs firms to source materials locally (so-called) *backward* linkages, is beneficial to the domestic industry in terms of increased output and employment and improved production efficiency, technological and managerial capabilities, and market diversification. Ernst and Kim (2002) suggest that network participation may provide new opportunities for effective knowledge diffusion to local firms in developing countries, on condition that appropriate policies and support institutions are in place which enable local firms to exploit the opportunities and pressure that result from network participation.

Moreover, close linkages can be established through clustering, which is a natural phenomenon where by firms and other industrial players establish their businesses close to each other, and cooperate around a common functional niche, in order to enhance competitiveness. An industrial cluster is generally referred to as a geographic concentration of interconnected firms in a particular field with links to related institutions, such as financial providers, educational institutions, and various levels of government (Zeng, 2011). These entities are linked by externalities and complementarities of different types and are usually located near each other (World Bank, 2009). Increasingly, both developed and developing countries use cluster initiatives to promote economic development. There is a growing recognition that cluster initiatives could be an effective means for producing an environment conducive to innovation (Andersson et al., 2004). While Porter (1990) refers to clusters as building blocks for modern economic development, the World Bank (2010) states that

clusters have been viewed as a mechanism for enabling firms to join their efforts and resources and work with government toward greater regional, national, and international competitiveness.

Nadvi (1999) highlights four key variables that determine competitiveness in enterprise clusters, namely; market access, labour-market pooling, intermediate input effects, and technological spill-overs. Nadvi (1999) and Meyer-Stamer (1998) recognise that clustering offers unique opportunities for firms to take advantage of a wide array of domestic links between users and producers and between the economy's knowledge sector and its business sector. Mytelka (2004) also emphasises the role of clusters in promoting the kind of interactivity that stimulates innovation. Clusters further enhance industrial competitiveness through product specialisation and improve the collective efficiency through business value chains and lowered transaction costs, while fostering a high degree of networking and interconnections that encourage knowledge and technology spill-overs (Zeng, 2011).

A study of 11 clusters across several African countries revealed that most of them formed spontaneously, with the exception of the Mauritian textile cluster, which evolved from an export processing zone (Zeng, 2008). Each cluster has its own development trajectory and was formed uniquely (Zeng, 2011). Zeng (2011) further suggests that the innovative cultures are closely linked to domestic enterprises and industrial clusters through supply chains or value chains. According to Farole and Akinci (2011), "clustering of companies and industries in a SEZ could provide multiple advantages not only to apply different components of a climate-friendly policy and investment regime, but also to target existing or future zones".

2.6.2 SEZs and Micro, Small and Medium-scale Enterprises (MSMEs) Internationalisation

The definition of micro, small and medium-sized enterprises (MSMEs) varies, but is usually based on staff numbers, revenue and the value of assets. They are a heterogeneous group with a diverse range of company sizes, capabilities and business activities; from the metal fabricator producing window and door frames for the local

construction market, to a sophisticated engineering or software firm exporting to overseas markets. For the purpose of this study, MSMEs are firms employing not more than 250 employees and an annual turnover of less than Euro 50 million with a balance sheet total of less than Euro 43 million (OECD, 2005). MSMEs occupy an important position in any country's economy and typically employ around 35-45% of the work force and contribute 30-40% of national added value (DHL, 2013). According to OECD (2007), cited in Laghzaoui (2011), MSMEs represent between 95 % and 99 % of the firms globally, and contribute between 60% and 70% of the jobs created (Laghzaoui, 2011). As the backbone of every economy, they stimulate growth and help diversify economic activity, they are flexible and can adapt quickly to changing market demand and supply situations, they drive innovation, and they make a significant contribution to exports and trade. The MSMEs form an essential source of growth and dynamism both for advanced industrialised countries and for emergent economies (Agndal and Chetty, 2007).

Similarly, various definitions of internationalisation concept have been adopted by different researchers to justify their work. For instance, according to Johanson and Vahlne (1977), internationalisation refers to a process that occurs in phases in which firms enhance their involvement gradually over time. In addition, Welch and Luostarinen (1988) define the concept as a process of intensifying engagements in foreign operations, while Beamish (1990) uses a broader definition of internationalisation that refers to "the process of increasing awareness of direct and indirect influence of foreign transactions on a firm's future and the firm's establishment and business transactions with other countries."

Many descriptions and analyses of the internationalisation behaviour of MSMEs are proposed in different literatures (Laghzaoui, 2011). Studies on the MSMEs' internationalisation have intensified in an attempt to determine the process and the reasons for MSMEs internationalisation (Hutchinson et al., 2005; Ruzzier et al., 2006; and Doole et al., 2006). According to Julien (1997) MSMEs are no longer viewed simply as miniatures of large firms but as particular enterprises with their own characteristics.

None the less, a number of studies in the area have suggested that MSMEs are disadvantaged in terms of innovation due to low levels of human capital, lack of finances for innovation (Traill and Grunert, 1997), limited absorptive capacity (Menrad, 2004), and diseconomies of scale (Nooteboom, 1994). Furthermore, smaller firm size is thought to result in lower levels of dedicated research and development (R&D) resources, personnel and facilities in manufacturing firms (Supnithadnaporn and Jung, 2007; Shefer and Frenkel, 2005). Certainly, the lack of financial, physical or technological resources, the lack of opportunities and the insufficiency of certain managerial skills can limit the international activity of MSMEs (Madhok, 1997). Most often, the internationalisation opens up new opportunities for MSMEs to enhance the development of their own innovative capabilities.

According to Johanson and Vahlne (1977), there is an explanation perspective which emphasises on the experience gained gradually as key to internationalisation process. Laghzaoui (2011) state that if a firm integrates the knowledge it gathers from its experience in the foreign markets, the decision-making process will improve. This concept implies that as the international experience increases, the psychological distance separating SMEs from the new foreign territories diminishes (Johanson and Vahlne, 1977). Laghzaoui (2011) argues that the SMEs' networking practices are relevant to explain different SMEs' behaviours on the international arena. The need for matching together the contributions of these approaches and taking into account the SMEs' characteristics becomes more important, hence, the concept of resources and competencies (Laghzaoui, 2011). Resources and competencies can be related to:

- The firm's characteristics: Size, productivity, financial, technological capacities (Suarez-Ortega and Alamo-Vera, 2005; Doole et al., 2006);
- The managerial characteristics like attitudes and the perceptions (Suarez-Ortega and Alamo-Vera, 2005), age, formation, experience (Hutchinson et al., 2006).
- The environmental characteristics, namely; market, technology, suppliers, customers, competitors, and the milieu where the SMEs are embedded (Fourcade, 2002) and develop networks.

The internationalisation process, therefore, is the result of a combination of various resources and competencies controlled by SMEs (Laghzaoui, 2006). Like Julien (1997) intimated, for MSMEs to be integrated in the SEZ value chain, research has revealed that, they must possess key variables or characteristics which will enhance diffusion of new technologies and absorption of skills. In summary, the trajectory of internationalisation followed by MSMEs is also determined by the factors which are specific to the firm such as financial, technological, organisational resources, and its environment like the sector and the networks (Gemser et al., 2004).

2.6.3 The Theory of Absorptive and Innovative Capacities of Firms

The strategic and systematic opening up of internal innovation processes to include external knowledge can result in significant competitive advantages, and a firm's ability to innovate is key to its success. The capacity of a firm to absorb scientific knowledge is associated with the disciplinary profile of its human resources (Castrol et al., 2010).

A concept that is used interchangeably with absorptive capacity is *technological capability*, defined as "the ability to make effective use of technological knowledge in efforts to assimilate, use, adapt, and change existing technologies" (Kim, 1997). Technological capabilities are a key component for competitiveness at firm levels. Firms strive to learn and generate knowledge faster than their competitors to gain the sustainable competitive advantage essential for their survival. From the macro-economic point of view, the concept of absorptive capacity is referred to the ability of an economy to effectively utilise its capital resources (Adler, 1965). Cohen and Levinthal (1990) have defined the absorptive capacity as the "ability to recognise the value of new, external information, assimilate it, and apply it to commercial ends". From their understanding, the capacity to absorb knowledge is a relational concept that refers back to the notion of interaction between internal and external characteristics of companies in the development of internal innovative capacities. The concept attempts to pinpoint two types of related processes, which include; internal knowledge interactions within firms, whose practices and dynamics are part and parcel of organisational routine, and the external interactions of firms that permit them to attract

knowledge available in the organisational environment and use a number of assimilation mechanisms to integrate such knowledge into the innovation processes.

Mowery and Oxley (1995) offer a complementary definition and refer to absorptive capacity as "a broad set of skills needed to deal with the tacit component of transferred knowledge and the need to modify this imported knowledge". Zahra and Georges (2002) further define absorptive capacities from an integrative perspective, as "a set of organisational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organisational capability". They differentiated two key factors, namely:

i. *Potential absorptive capacity* which includes knowledge *acquisition* capacity that involves skills in identifying and acquiring external knowledge, and a*ssimilation* capacity, referring to skills in analysing, interpreting and understanding the knowledge acquired from external sources.
ii. *Realised absorptive capacity* which refers to the firm's ability to *transform* the knowledge and effectively integrate it into a firm's routines and processes, and to *exploit* the knowledge by creating re-combinations of new and existing knowledge to innovate (in products or processes) as a way of creating commercial value.

Based on their definition of absorptive capacity, Zahra and George (2002) proposed a conceptual model (refer to Figure 2.2) of absorptive capacity that connects the external knowledge sources, the elements of absorptive capacity and the outcomes of the process.

The model suggests that a firm's potential absorptive capacity is influenced by its experience, plus the sources of external knowledge, including acquisition of knowledge through, purchasing, licensing, contractual agreements, R&D, and joint ventures. The model indicates that internal and external activation triggers have an impact on a firm's development of absorptive capacity. Activation triggers incorporate not only a firm's internal crises, but also external market fluctuations. Absorptive capacity involves both transformation and exploitation of knowledge. Zahra and George (2002) suggest that,

in order to have successful exploitation of newly acquired knowledge, there must be a sharing of knowledge among members of the firm. Social integration mechanisms can facilitate the process and reduce the gap between potential absorptive capacity and realised absorptive capacity. Social integration mechanisms cover social arrangements encouraging employee interactions, whereas regimes of appropriability provide effective protection against imitation and facilitate returns on innovation investments. The successful development of absorptive capacity will contribute to a firm's achievement of competitive advantage.

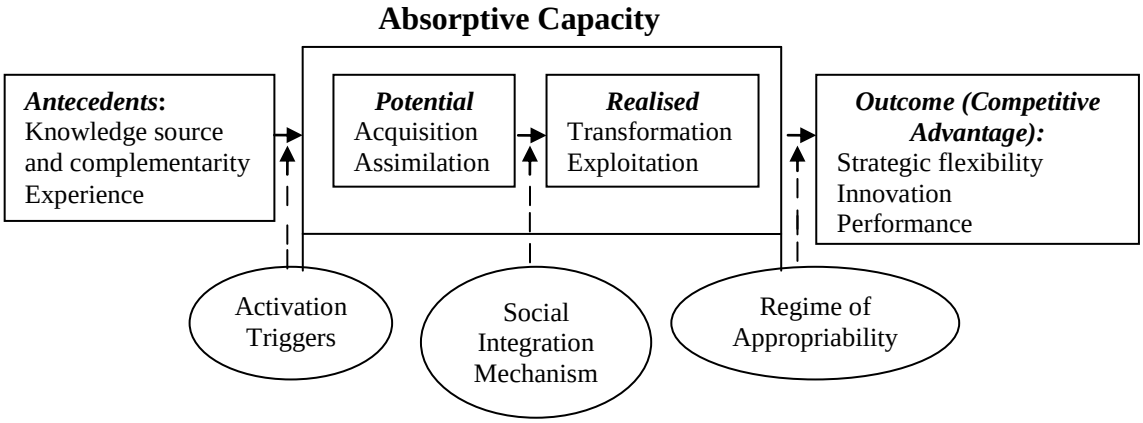


Figure 2.2: Model of Absorptive Capacity
Source: Zahra and George (2002)

According to Lane and Lubatkin (1998), innovation is a process combining 'basic knowledge', which permits the general understanding of the traditions and techniques used in a particular field of disciplines and technologies, and a 'diversity of knowledge', which enables the creative use of a range of knowledge. This combination of knowledge strengthens the platform from which learning by interaction is possible and increases the levels of creativity applied to the solution of complex problems (Cohen and Levinthal, 1990; Lane and Lubatkin, 1998; Zahra and George, 2002). According to Schumpeter (1934) cited in Nurul (2010), innovation is defined as the introduction of a new good and new production method, as well as the opening of a new market and a new source of supply. Similarly, Lundvall (1992) describes innovation as an on-going process of exclusion, search, and exploration resulting in new products, new techniques, new organisational forms, and new markets.

Referring to previous studies on absorptive and innovative capacities, Cohen and Levinthal (1990) proposed that the ability to exploit external knowledge was a function of prior knowledge. Evidently, prior knowledge permits the *assimilation and exploitation* of new knowledge to the extent that a portion of the knowledge pre-existing in a firm is one step to the side of the new knowledge and acts as a bridge between the knowledge accumulated and assimilated and the different, as yet unassimilated knowledge, facilitating its creative use. Without accumulated knowledge it is not possible to interpret and evaluate what is different and original in the new knowledge. Therefore, Cohen and Levinthal (1990) summarised that absorptive capacity accumulated over a period of time permits more efficient accumulation in the following period. Schmidt (2010) also suggests that the perceived value placed on external knowledge and a firm's receptivity to engaging with sources of such knowledge would be reflective of their absorptive capacity. He divided external knowledge sources into two tiers, namely; the first level incorporating the intra-industry knowledge of customers, suppliers and competitors, while the second level refers to the knowledge from universities or other public research institutions (Fu, 2007). Further studies suggest that the adoption of new technology depends on the "absorptive capacity" or "social capability" of the imitator (Wolff, 2001; Falvey et al., 2007).

Based on the UNCTAD report (1999) TNCs can transfer technologies through both FDI and non-equity forms of TNC involvement such as franchising, licensing and sub-contracting. Several economic, strategic and policy factors determine the mode of technology transfer: the nature and speed of change of technology, transfer costs and risks, corporate perceptions of benefits and risks and government policies all play a role (UNCTAD, 1999). Interestingly, a number of economies that succeeded most in building up domestic technological capabilities through this medium include the Republic of Korea and Taiwan Province of China (UNCTAD, 1999). This medium of technology transfer often encouraged the absorption of imported technologies in a strongly export-oriented setting, thus forcing local firms to develop and deepen their own technological capabilities (Lall, 1995). As firms became internationally competitive they had to import technology either by going into other arrangements such

as franchising or original equipment manufacturer and/or by investing in their own R&D (UNCTAD, 2011).

2.6.4 Absorptive Capacity and Technology and Skills Diffusion in the SEZs

Technological progress is critical to economic growth and social welfare for any nation, irrespective of the level of development. However, for most developing countries, technological progress is mainly a process of adoption and adaptation of technologies from abroad rather than the creation of new technologies. Therefore, the transfer and diffusion of technology are crucial to building their domestic technological capabilities; and the role of Governments in supporting this process. Technology is a collection of physical processes that transform inputs into outputs with procedural techniques and organisational arrangements for carrying out the transformation (Wie, 2003). As Lorentzen et al. (2003) state technology involves knowledge, equipment, and documents that help firms to upgrade their performance. Technology transfer, therefore, is one of the strategic means to enhance the nation's technological capabilities (MITI, 2010) through the introduction of new techniques by investing in new plants, the improvement of existing techniques or technologies and the generation of new technology and innovation (Hoffman and Girvan, 1990). Technology diffusion, as defined by Jain and Triandis (1990), is a process by which science and technology are transferred from one individual or group to another that incorporates the new knowledge into its way of doing things. According to Sarkar (1998) technology diffusion refers to a mechanism that spreads "successful" varieties of products and processes through an economic structure and displaces wholly or partly the existing "inferior" varieties.

While the processes of invention and innovation are necessary pre-conditions for the development of a new technology, it is the process of diffusion that determines the extent to which the new technology is being put to productive use, which in turn, determines the level of technological dynamism in a firm, industry or an economy (Sarkar, 1998).

Some of the examples of absorption would include; adopting new products and manufacturing processes developed elsewhere, upgrading old products and processes,

improving organisational efficiency and achieving quality certification. Technological capabilities are a key component of competitiveness at national, regional or firm levels. Innovation has widely been regarded as one of the main drivers of economic growth in the knowledge economy. The development of innovation capabilities has been of crucial importance for competitiveness building in both developed and developing countries (Fu, 2007). Observations suggest that the success of SEZs in stimulating innovation and encouraging technology transfer appears to depend on the following conditions and features of the domestic economy (Johansson and Nilsson, 1997; Omar and Stoever, 2008):

1) Domestic technological capabilities, both of firms and of individual employees;
2) The partial integration of the SEZs in the local economy; and
3) A strategic geographic location for the SEZs.

2.7 Chapter Summary

The Zambian manufacturing sector posted steady growth till early 1974, when the global economic depression was experienced up to 1979, due to copper and oil prices. The early development of manufacturing sector took place against a backdrop of high copper export earnings. Since then, the development, economic and business performance of manufacturing sector industries has been marginal, suffering from increasing inefficiencies in an import substituting and interventionist environment.

In order to counter the effects, the Zambian Government, like most African Governments, undertook institutional reforms, macro-economic and structural interventions, such as the establishment of Special Economic Zones (SEZs), rebranded as the Multi-facility Economic Zones (MFEZ) in 2003. Specific interventions focused on the local market development, standardisation and quality assurance, tax policies and improving the business regulatory environment. The concept of SEZ and its positive impact on economic growth has been accepted globally and the instrument has been widely applied. The case in point is China, where SEZ has proven to be a successful model in industrialisation, modernisation, and internationalisation of local firms (Farole and Akinci, 2011). Taking a proactive approach to internationalisation

makes local firms more robust and potentially more successful, as they create business linkages and synergies with TNCs in the zones (refer to Figure 2.3).

The establishment of these strong linkages in the zone requires the participation of Government through supportive policies, as well as TNCs and local manufacturing firms/MSMEs through their vision and commitment (UNCTAD, 2006). As illustrated in Figure 2.3, the interaction of these major stakeholders in the MFEZ setup must be supported by the flow of information between research and technology institutions such as universities and National Institute for Scientific and Industrial research (NISIR) and industry as well as Government.

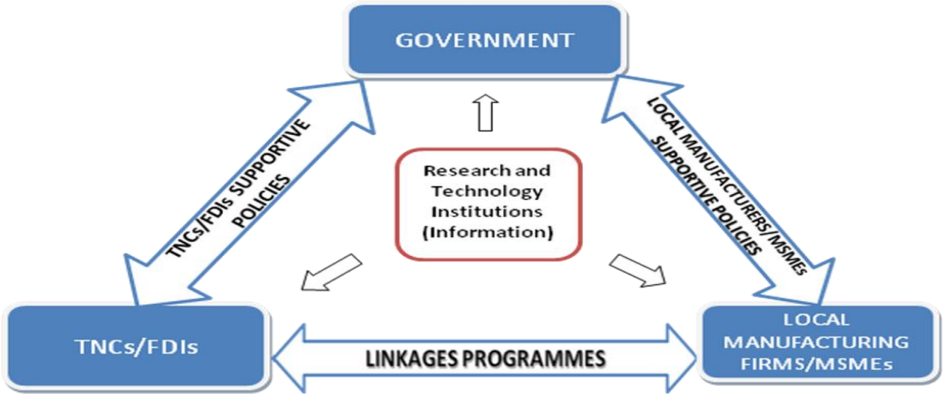


Figure 2.3: Stakeholder Interactive Triangle
Source: Own

Therefore, the establishment of the MFEZs provides an opportunity for enhancing technology transfer and diffusion, stimulating learning, innovation and productivity, technological and managerial capabilities, and market diversification in local manufacturing firms. By tapping into global knowledge and plugging into the local economy, SEZs can be expected to efficiently foster innovation. The main concern is whether the local firms are able to identify these opportunities, exploit them and realise their potential capacities.

Generally, SEZs' success is assessed in terms of the new investment stimulated, new jobs created, increased exports, and the creation of backward and forward industrial linkages along and across value chains, stimulating the emergence of new skills and expertise and increasing economic diversification.

CHAPTER 3

THEORETICAL AND CONCEPTUAL FRAMEWORK

3.1 Introduction

This chapter explores the theoretical framework for understanding relations between absorptive and innovative capacities, and technology transfer and diffusion at the firm, industry and country levels in a special economic zone. It presents the conceptual framework concerning the firm's asset characteristics, absorptive capacity and domestic conditions supportive of business linkages formation between Foreign Direct Investments (FDIs) in the MFEZ and domestic firms.

3.2 Theoretical Framework

The MFEZ approach to industrialisation in Least Developing Countries (LDCs) is Foreign Direct Investment (FDI) - led. It is generally accepted that sustainable industrialisation through MFEZs route is possible if the local industrial capital is able to replace foreign investment in management, technology, design, factory operations, logistics, quality management, and marketing (UNCTAD, 2006). It is envisaged that MFEZs will lead to the arrival of sufficient mass of manufacturing TNCs that would enhance the competitiveness, diversification and accelerated industrialisation in the economy. This in turn will stimulate local industrial development through business linkages supported by appropriate policies. In particular, backward linkages between TNCs and domestic firms are important for enhancing technology capability of the latter.

The success and the rate at which the local manufacturing firms internalise and translate the transferred knowledge into their own capability through learning is determined by their absorptive and innovative capacities and their ability to upgrade it continuously (Ernst and Kim, 2002). The absorptive and innovative capacities are, therefore, key determinants of the readiness of the local firm to participate in the MFEZ production value chains. The higher the absorptive capacities of the local firm, the higher the potential for the firm to adopt new innovations, adapt them to the local setup and eventually sustain them.

Absorptive capacity allows firms to borrow and exploit outside knowledge that may not be ready to use for innovation process, but which constitutes the basis for subsequent R&D (Cohen and Levinthal, 1989). Therefore, strengthening absorptive capacity means creating and facilitating opportunities for local enterprises to learn, internalise and utilise the management skills, knowledge and technology made available by direct TNC linkages (UNCTAD, 2006) through socialisation and labour mobility. Absorptive capacity endeavours to promote the speed, frequency and magnitude of product innovation by acting as a conduit of inter-organisational information/knowledge sharing (Kostopoulos et al., 2011). Further, a firm's absorptive capacity promotes the new product development endeavours by acting as a medium through which newly acquired information is communicated between different units or departments of the firm (Kostopoulos et al., 2011; Müller-Seitz, 2012). Consequently, the complementary information embedded in different organisational units or departments can be translated into new products through transformation and assimilation of external information (Zahra and George, 2002).

As technology transfer involves the process of transmission and absorption of knowledge (Davenport and Prusak, 2000), the recipient firm's ability to absorb the knowledge transferred is dependent upon the degree of their absorptive capacity. Therefore, a firm is deemed to be ready if it possesses such operational characteristics as quality, cost, delivery performance, flexible systems, customer service, and technological capabilities, which are embedded in the firm's asset characteristics such as the stock of skilled human resources and advanced manufacturing systems.

3.3 Conceptual Framework Development

Based on the afore-mentioned theoretical framework, the current study's conceptual model focuses on the relationship between the firm's asset characteristics like human capital, machinery and equipment, manufacturing systems and innovations and quality management systems, and the absorptive and innovative capacities, as dependent variables of local manufacturing firms necessary for participation in MFEZs production networks. This participation is facilitated by the domestic conditions characterised by policies in place (refer to Figure 3.1).

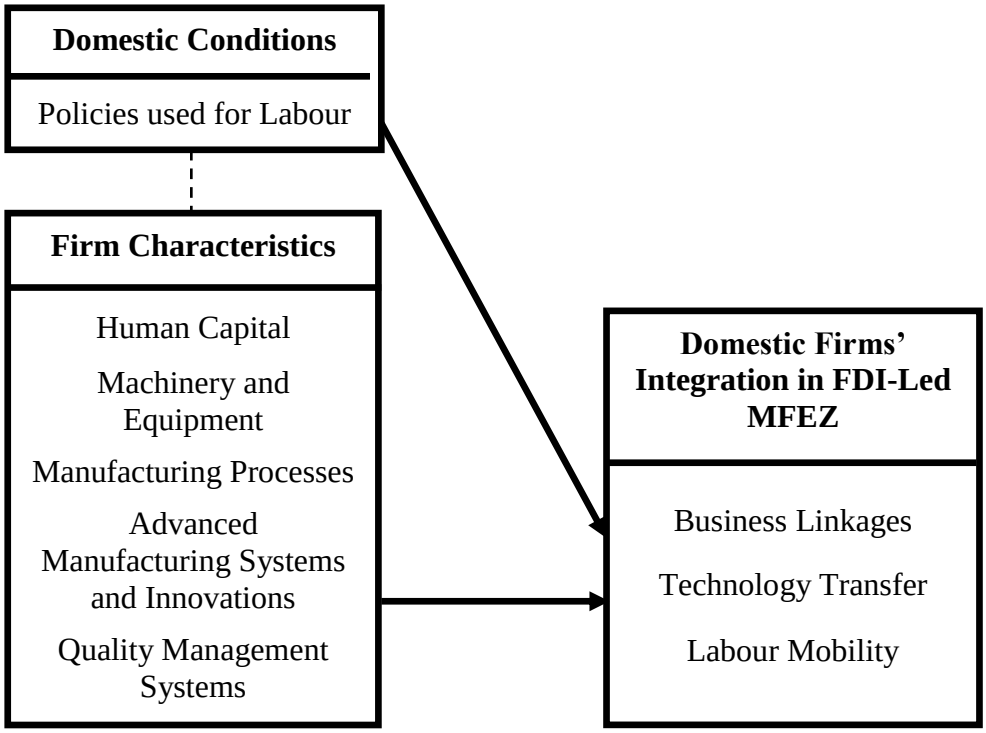


Figure 3.1: Conceptual Framework: Firm Characteristics and the Domestic Firms' Integration in FDI-Led MFEZ

This study's conceptual model is based on an operational MFEZ, where-in the goals and objectives are clearly defined. According to Figure 3.1, labour-based policies and firm characteristics affect integration of domestic firms into the MFEZ value chains. The value chains refer to the sets of activities performed by an organisation from the relationship with suppliers, through the production and sale cycles, to the final

distribution phase (Bornstein, 2003). In this study, the following are the independent variables:

i. Human capital: Availability of competent and skilled workforce, with prior knowledge to assimilate and use information. Human capital also includes education, vocational qualifications, professional certifications, work-related experiences of the workforce.

   Rastogi (2002) conceptualises the human capital as 'knowledge, competency, attitude and behaviour embedded in an individual'.

ii. Equipment and machinery: These refer to both General- and Special-purpose machinery embedded with advanced manufacturing technologies for designing and engineering, fabrication and assembly, material handling, inspection and storage such as robotics. These technologies enhance flexibility, increase output and productive efficiency, and improve delivery performance.

iii. Manufacturing processes: A typical manufacturing process is thought of a chain, with overloaded work centres, defining the factory's output, such as process control and optimisation including wide range of control schemes to increase efficiency and customer service.

iv. Advanced manufacturing systems and innovations: These include Lean Manufacturing, Continuous Improvement, Management Excellence, Business Process Re-engineering (BPR), Just In Time (JIT), and teamwork with flatter, flexible, adaptable, dynamic, and participative organisational structures, increase absorptive capacity of the firm (Daghfous, 2004). Organisational structures include reporting lines, hierarchies, and the way that work flows through the business. How the decision-making process structured.

v. Quality management systems: This refers to firm's quality certification to National and/or International Standards bureau. The complimentary organisational practices such as Total Quality Management (TQM) have generally been found to have positive influences on economic performance,

including productivity and profitability (Kato and Morishima, 2002; Colombo et al., 2007).

The afore-mentioned independent variables will affect the following dependent variables:

i. Business Linkages: These include forward and backward linkages with customers and suppliers, respectively. Other linkages may be with competitors and technology partners (FDI firms). However, the establishment of these business linkages is directly related to the participation of Government through enactment of supportive labour policies, as well as TNCs and domestic firms through their vision and commitment (UNCTAD, 2006). These business linkages may result in higher rates of knowledge and technology diffusion, through a number of mechanisms, such as backward and forward linkages, imitation, competition and human resources mobility (UNCTAD, 2011).

   Business linkages offer new market opportunities for domestic firms when the FDI firms purchase components, materials and services locally. FDI firms may also assist prospective domestic suppliers to set up production facilities, provide training in management and organisation, and assist them to diversify by finding additional customers.

   Furthermore, the quality of business linkages is heavily dependent upon the human capital (education, skills and experience). Education and training are important aspects of an organisation's preparation for change. The quality and stock of work-force plays a critical role in the firm's performance. Sufficiently skilled labour force assimilates and adapts new knowledge to local conditions and fosters technology transfer. Strong business linkages can in turn, promote production efficiency, productivity growth, technological and managerial capabilities and market diversification in domestic firms.

   Quality management systems (QMS) can also affect the business linkages and technology competitiveness of a firm. The likelihood of exports prospects is increased when the firm is quality certified with a standard bureau either at

local or international level. QMS can help develop a vision that enables all members of an organisation to focus on quality improvement, thus creating linkages with FDIs and accessing new global markets. According to UNCTAD (2001), the single most important host country factor influencing linkage formation is the availability of domestic suppliers with competitive costs and quality.

ii. Technology Transfer: This refers to a movement of ideas, skills, information, technical know-how and people from the providing organisation to the recipient organisation (Harrison and Samson, 2002). The degree and efficiency of technology transfer is crucial for host countries' economic growth. Related to technology transfer is the absorptive capacity, which is defined as 'a set of organisational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organisational capability' (Zahra and George, 2002). The strength of the domestic knowledge base determines the level of sophistication of the converted knowledge, while the intensity of effort accelerates the speed of the conversion processes (Ernst and Kim, 2002). Interestingly, it is suggested that absorptive capacity plays an important role in facilitating technology transfer (Griffith et al., 2003; Borensztein et al., 1998). Dyer and Singh (1998) also suggest that absorptive capacity of firms is based on social interactions, collaboration and individual relationships. Madanmohan et al. (2004) suggested that the extent of firm's technology absorptive capacity will determine their level of participation in technology transfer process and the type of technology that they can operate efficiently.

Infrastructure such as machinery and equipment, and manufacturing processes including human capital are closely related to the transfer of technology. When the levels of technology, innovation and manufacturing systems in the domestic firm are high, then integration of domestic firms into the MFEZ value chains will be smoothened. In the highly competitive environment, an on-going up-grading of a firm's assets is essential. With quality infrastructure and advanced

technologies in the MFEZs and IPs, which increase value-addition and the competitiveness of the goods, domestic firms have the opportunity to diversify into exporting. Through socialisation and demonstrations, the knowledge pattern of the domestic firms will be impacted by the acquisition of machinery and equipment, which embodies advanced technologies, product and service specifications, and production and quality assurance manuals in order to help the domestic firms develop capabilities necessary to produce products and services competitively.

Technology transfer is influenced by advanced manufacturing systems and innovations. The use of teams, job-related training and career development programmes, decentralised decision-making system, and flatter structures also implies that better use can be made of local knowledge, leading to improvements in processes and perhaps to minor product improvements (Laursen and Foss, 2003).

However, technology transfer is not possible unless there is prior related knowledge (human capital) possessed by the local workforce. Koc (2007) discovered that innovation capacity and technology transfer were positively affected by the depth and variety of employee skills and experience. Rothwell and Dodgson (1991) further found the positive correlation between the level of education and the absorptive capacity. They suggested that domestic firms needed to employ well-educated technicians, engineers and technological specialists to access knowledge from outside their boundaries.

Cohen and Levinthal (1990) attribute a component of the absorptive capacity to the level of the stock of knowledge and training skills (Wagner et al., 2003) present within a firm. The knowledge diffusion within the local firms will be through spiral processes of socialisation. None the less, the touchstone is the capacity of the local firms to absorb new knowledge, by taking an active approach to maximise their benefits from the MFEZ networks, and become more competitive. More investment in human resources development may improve the firm's absorptive capacity and long-term sustainability, as Cohen

and Levinthal (1989) intimate that prior knowledge and diversity of background impacts the absorptive capacity, consequently, affecting the worker's productivity in the workplace.

iii. Labour Mobility: According to Long (2002) and Ferrie (1999) labour mobility consists of changes in the location of workers both across physical space (geographic labour mobility) and across a set of jobs (occupational labour mobility). While geographic labour mobility can be sub-divided into short- and long-distance moves, or into voluntary and coerced migration, occupational labour mobility is lateral (within a broad class of jobs similar in socio-economic status) or vertical (from one job to another job). Therefore occupational labour mobility is related to the labour-based policies enacted by the Government. The enactment of enforceable policies (labour laws) in the MFEZs/IPs which encourage and/or compel FDI firms to employ more local workers for every expatriate, can facilitate the transfer of skills and knowledge to the local workforce, thus, enhancing human capital accumulation and domestic firms' capabilities needed to participate in the MFEZ value chains.

According to Long (2002) occupational labour mobility conveys important economic benefits, including the exploitation of complementary resources as they are discovered in new places, while re-allocation across sectors makes possible the use of new technologies and the growth of new industries. Referring to the conceptual model shown in Figure 3.1, technology and skills may spill over from FDI firms to domestic firms through labour mobility, where workers leave the FDI firms and decide to set up their own enterprises or join an existing MSME. Hence, domestic firms' development and competitiveness can be supported by favourable environment comprising broader policy, economic, social and cultural aspects. Eventually, business linkages among industry players will be enhanced.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

This chapter provides details of the methodology employed in the study and the justification for choosing such a methodology. It also discusses data sources, sample size and the tools employed in analysing the collected data.

4.2 Study Population and Sample Size

The sampling frame covered areas within the borders of Zambia, but concentration was in towns which were selected for the establishment of the MFEZs or IPs, and targeted the manufacturing sector. The Primary (mining and minerals) sector was also included in the study for comparisons sake due to its backward and forward linkages. The sample areas were Lusaka, Copperbelt, and Southern, Eastern and North-Western Provinces. From the list of the manufacturing firms as compiled by CSO, eleven sub-sectors were purposively selected for inclusion in the research (Appendix 8). Moreover, three Government departments in the Ministries of Labour and Social Security (productivity), Commerce, Trade and Industry (ZDA), and Finance (CSO) and further three foreign missions to Zambia that are directly linked to MFEZ development (Japan, Mauritius and China), were included in the sampling frame.

4.3 Survey Study

Literature revealed that the TNCs commanded an ever more important role in the economy, as they boasted of the following requisite key factors for successful partnership with the local manufacturing industry:

i. Quality equipment and machinery with advanced technologies in manufacturing operations such as Computer Numerically Controlled (CNC), Computer Aided Design (CAD), Computer Aided Engineering (CAE),

Computer Integrated Manufacturing (CIM), Flexible Manufacturing System (FMS), Programmable Logic Controllers (PLCs), Robotics, automated material handling and storage systems, manufacturing information systems, and Modeling and Simulation among other automated systems;

ii. Superior technological innovations, market diversifications and R&D;
iii. Improvement strategies for processes and products;
iv. Quality certification schemes and added-value services;
v. Human resources development strategies such as staff training, pay-for-skills, cross-functions, flatter structures, empowered decision–making; and
vi. They engage employees who possess higher knowledge, intellectual mastery, skills and carefully-nurtured interdependence (World Bank, 2009).

Thus, higher local *technological capability* is an important factor for attracting FDI or TNCs in high value-added activities. Technological capability is referred to as the ability to develop, search for, absorb, and exploit knowledge commercially (Fagerberg et al., 2009). To this effect, certain factors for domestic firms' strategic integration into global manufacturing networks were identified and considered, which included:

i. Physical facilities such as machinery and equipment including their utilisation capacities;
ii. Types of Technologies and Methods of production;
iii. Innovations and Market diversification;
iv. Added-value services;
v. Technical Standards;
vi. Sources of inputs and modes of transportation;
vii. Product competitiveness/critical factors; and
viii. Human Resources Development (breadth and depth of skills available).

4.4 Reliability and Validity of Results

In order to ensure reliability and validity in the distribution of the collected data, a random sample size of 10 percent of the population was picked, which translated into almost 30 firms out of about 297 active manufacturing firms. The firms chosen for study were a cross-section; included both foreign- and local-owned, and small- to

large-scale. The respondent firms were classified into sub-sectors according to major activity in conformity with the International Standard Industrial Classification (ISIC) Revision 4. The sampling frame for the study was constructed using register of companies from the Zambia Association of Manufacturers (ZAM) and the Zambia's Central Statistic of Office.

For qualitative data, purposive sampling was used on firm representatives such as the Chief Executive Officers (CEOs), Projects Superintendent (PS), Technical Managers (TMs), Operations Managers (OMs), Corporate Affairs Managers (CAMs) and the Human Resources Managers (HRMs), while for quantitative data; the multi-stage sampling was employed on other stake-holders such as Government departments and foreign missions. The sampling methods used were effective and less-time consuming.

4.5 Data Collection Techniques

In this research, both primary and secondary data was used. Secondary data was extracted from various bulletins, publications, archives as well as unpublished literature. Primary data was collected using the following methods:

i. Questionnaires;
ii. Personal interviews (structured and unstructured);
iii. Telephone interviews; and
iv. Observations of processes/process lines from industrial visitations.

4.5.1 Questionnaire Design

Eleven manufacturing sub-sectors and the Primary metals (mining and minerals) industry were identified for study (refer to Appendix 9 for detailed Questionnaire content and variables) out of which twenty-seven questionnaires were administered personally and another three were e-mailed to the firms which could not be reached or as per their request.

The questionnaire was designed to collect data in such areas as; the respondent company profile and general characteristics of the firms; including the main manufacturing activities, production capacity and utilisation levels, sources and types of raw materials and other inputs; awareness and knowledge of Multi-Facility

Economic Zones (MFEZs) and Industrial Parks (IPs); investment levels of technology, development and innovation; quality management systems and productivity, current technical skills and training, knowledge and human capital levels to meet dynamic trends in technology, which is an integral component in MFEZs' success.

4.5.2 Pre-Testing of Questionnaire

For certainty sake, a pilot survey was conducted on 6 manufacturing firms located in Lusaka Province only from 2nd April, 2012 to 11th June, 2012, whose major objective was to assess the appropriateness of the questionnaire in terms of:

i. The costs and incidentals, which determines the magnitude of the study;
ii. The period of the interview, so that the length of undertaking the main field study could be estimated objectively;
iii. The sensitivity of questions included in the questionnaire so that questions which respondents would be resistant or refuse to respond to were removed;
iv. The adequacy of the information captured; and
v. The phrases of questions, in order to determine whether the questions could easily be understood by respondents.

4.6 Data Analysis

The following analytical tools were used for both qualitative and quantitative data:

i. The quantitative data was analysed using Excel Spreadsheet format as well as the Statistical Package for Social Sciences (SPSS) software, in order to generate appropriate tables, graphs and charts which were used to display the trend.
ii. For qualitative data such as technologies, innovations and manufacturing management systems which were currently in use by locally-owned manufacturing firms and TNCs, SPSS was used to cross-tabulate the manufacturing sub-sectors in form of charts and graphs. Using these charts and graphs, a comprehensive identification, analysis and comparisons of different manufacturing sub-sectors were made.

CHAPTER 5

RESEARCH FINDINGS AND DATA ANALYSIS

5.1 Introduction

This chapter presents the survey findings and data analysis on several factors (technologies, innovation and manufacturing management systems) necessary for local manufacturing firms to be strategically integrated into the global manufacturing networks. It also covers the respondent firms' profile, awareness and knowledge, and appropriateness of the MFEZs and/or IPs in Zambia.

5.2 Respondent Company Profile

This Section profiles the respondent firms in terms of the number of product lines, productive efficiency, sources of inputs and the means of transportation for the inputs.

5.2.1 Response Rate

Out of thirty questionnaires issued, only seventeen personally administered questionnaires and one e-mailed questionnaire were answered from six manufacturing sub-sectors and a further three personally administered questionnaires were received from the Primary Metals/Mining sector, representing a 70 percent response. The response rate is illustrated in Table 5.1.

Table 5.1: Respondents Sample

S/N	Manufacturing Sub-sector/Industry	Town/City	Province	Questionnaires	
				Issued	Answered & Returned
01	Food, Beverages and Tobacco	Lusaka	Lusaka/Kitwe	7	5
02	Chemicals and allied Products	Lusaka	Lusaka	4	2
03	Plastics and Rubber Products	Lusaka	Lusaka	4	4
04	Fabricated Metals and Products	Lusaka and Kitwe	Lusaka and Copperbelt	6	4
05	Paper and paper products	Lusaka	Lusaka	2	1
06	Textiles, Apparel and Leather	Chipata and Livingstone	Eastern and Southern	3	2
07	Primary Metals/Mining	Kalulushi	Copperbelt	3	3
08	Non-metallic/Mineral Products and Construction	Lusaka	Lusaka	1	0
Total				**30**	**21**

Personal interviews were conducted with Chief Executive Officers (CEOs), Human Resources Managers (HRMs), Technical Managers (TMs), Operations Managers (OMs), Projects Superintendent (PS), and Corporate Affairs Managers (CAMs). Two CEOs in Fabricated Metals sub-sector, one CAM in Wood/Lumber and Products sub-sector and two HRMs were interviewed. Telephone interviews were conducted with geographically dispersed organisations located in Livingstone, Chipata and Solwezi. Unfortunately only two respondent managers (CAMs) in Solwezi and Chipata answered while four refused to be interviewed and others never answered. However, during survey, the following constraints were encountered:

i. Some firms were not helpful and were unwilling to disclose certain information on their activities, especially sales revenue and other operational costs. This information would have helped in assessing value-added per employee, which is used as a measure of productivity.
ii. Some of the data was collected from delegated subordinates who were not privy to certain information requested for as their superiors were busy. Consequently, this resulted in not collecting the desired number of answered questionnaires from certain manufacturing sub-sectors such as the Wood/Lumber and Industrial Machinery and Spares sub-sectors among others, hence reducing the sample size.

5.2.2 Production Lines

The production line is a set of sequential operations established in a factory whereby materials are put through a refining process to produce an end-product that is suitable for onward consumption; or components are assembled to make a finished product. At each station in the production process, a worker or machine adds a piece to the wok-piece, performs a quality control check or some other job that is essential to the completion of the product. For instance, metal processes include crushing, smelting and further refining.

With the exception of the respondent firms in the Chemicals and Allied Products sub-sector which had more than twenty-eight product lines in its facility, the Fabricated Metals, Textiles, and Plastics and Rubber Products sub-sectors had an average of three product lines while the Food, Beverages and Tobacco averaged one product line. As shown in Figure 5.1, the survey revealed that 31 percent of respondent firms in aggregated sub-sectors studied had plans to install another production line, to produce new products in a new market in 2011, 36 percent planned to introduce new production lines for new products by 2012 in their current market and 33 percent of them planned to diversify or add capacity in 2012.

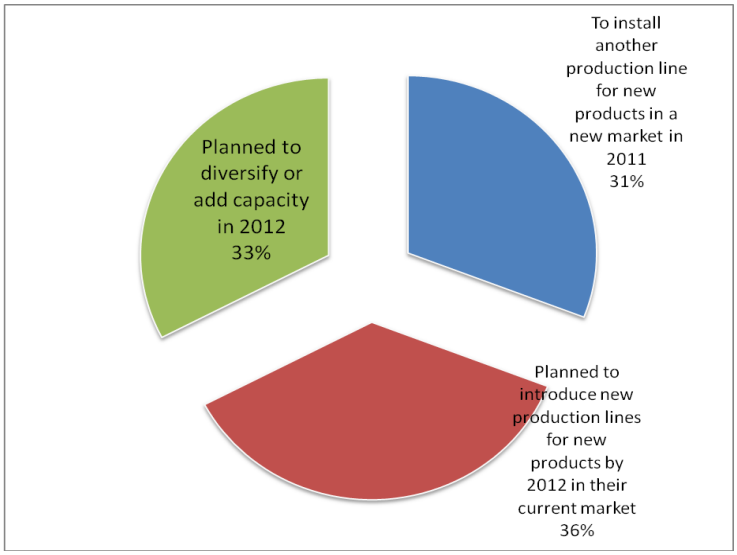


Figure 5.1: Production Lines - Aggregated Manufacturing Sub- sectors

5.2.3 Capacity Utilisation (Productive Efficiency)

Capacity Utilisation is a concept in Economics which refers to the extent to which an enterprise or a nation actually utilises its installed productive capacity (MCTI, 2007). As output rises average production costs tend to fall, thus making a business more competitive. Capacity Utilisation is calculated as (www.RevisionGuru.co.uk):

$$\text{Capacity Utilisation (\%)} = \frac{\text{Actual Output Per Year}}{\text{Maximum Possible Output Per Year}} \times 100\% \qquad \textbf{Eqn. 1}$$

From the survey, it was found that capacity utilisation stood at 71.7 percent in Food, Beverages and Tobacco, 78.9 percent in Textiles, 72 percent in Chemicals and Allied, while the Plastics and Rubber, and the Fabricated Metals sub-sectors recorded 97 percent and 60 percent, respectively as illustrated in Figure 5.2.

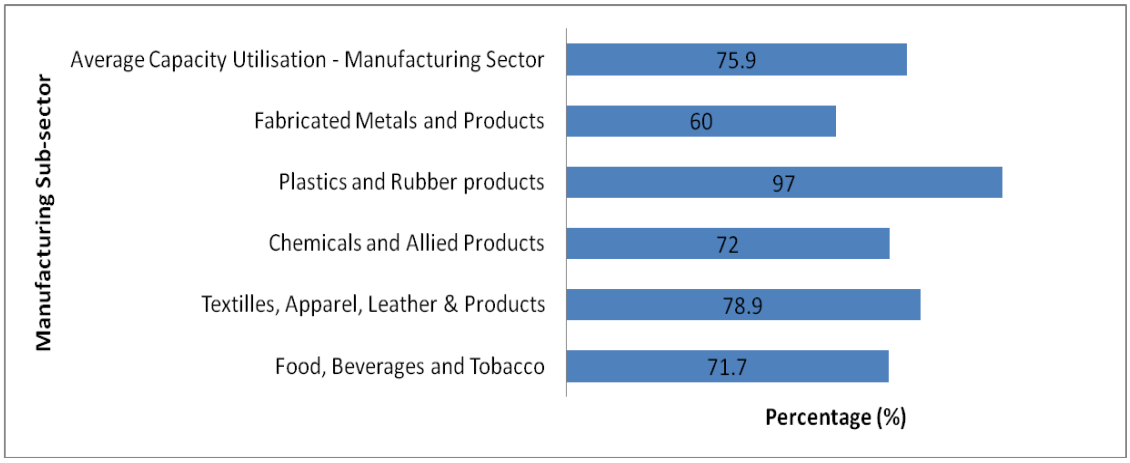


Figure 5.2: Percentage Capacity Utilisation Per Manufacturing Sub-sector

Overall, the capacity utilisation for all the manufacturing sub-sectors which were surveyed averaged about 75.9 percent.

5.2.4 Sources of Inputs and Modes of Transportation

5.2.4.1 Sources of Inputs

As shown in Figure 5.3, which aggregates manufacturing sub-sectors, 33.3 percent apiece of the respondent firms revealed that their primary raw materials were sourced locally and outside the country, respectively, while 23.8 percent, 38.1 percent, 14.3 percent, 57.1 percent and 42.9 percent of the respondent firms preferred to purchase their raw materials, secondary inputs (chemicals and food ingredients), consumables, spare parts and tools, respectively from both local and foreign suppliers. Figure 5.3 also indicates that 38.1 percent of the respondent firms purchased the consumables locally from the suppliers who imported them. It was discovered during the study that Iron, Steel and Zinc used in galvanising the iron sheets and coils, as well as aluminium circles, which could even be made locally were imported from RSA, Tanzania and India. Evidently, goods (inputs and finished goods) imports increased by 26 percent to $2.1 billion from $1.7 billion in the first half of 2010 (CSO National Accounts, 2011). This was mainly explained by increased imports of Iron and Steel (65.5%), plastic and rubber products (42.4%), paper and paper products (42.3%), fertilizer (41.7%), and industrial equipment (42.4%).

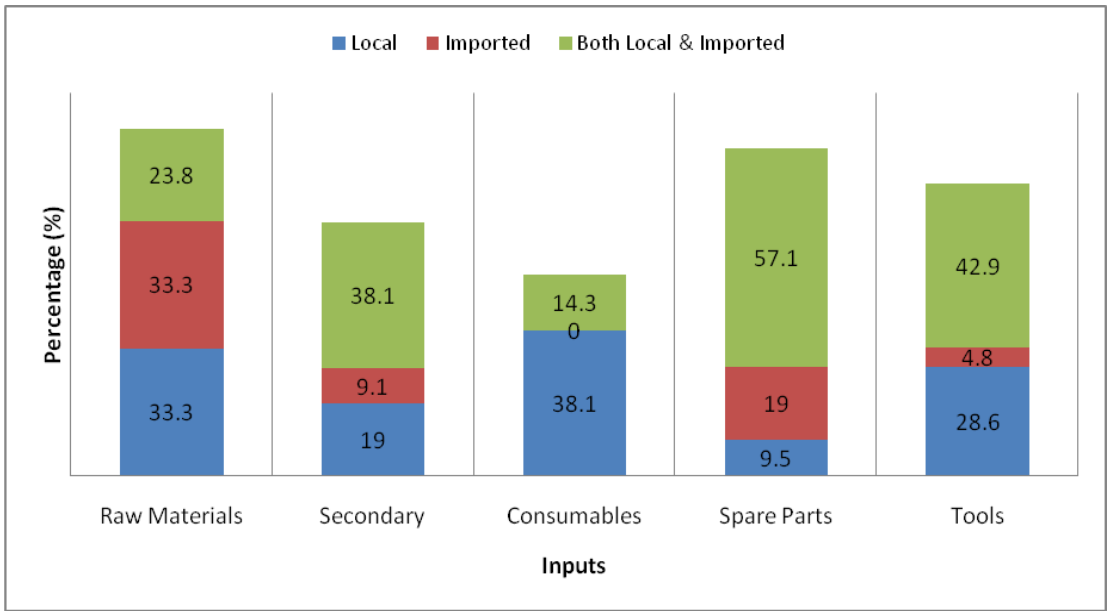


Figure 5.3: Sources of Inputs of Aggregated Manufacturing Sub-sectors

Some of the inputs included: Food preservatives and colourings; Sunbond, Stitchbonded, New flame retandant 2012, Dimenthy Silicone oil and Basalt for the Textile and Leather sub-sector; Polyacrylamnide and Caustic Soda for the Chemicals and Allied Products sub-sector while the Plastics and Rubber Products sub-sector imported Polypropylene, Inionic PAM Polymer and Silicone rubber.

Figure 5.4 shows the sources of raw materials per manufacturing sub-sector, where the only respondent firm in Paper and Paper Products and 50 percent in Plastics and Rubber Products sub-sectors imported all their raw materials, while 60 percent of the food, beverages and tobacco producing companies and 100 percent of the respondent firms in the Textiles, Apparel and Leather sub-sector sourced their raw materials locally. Furthermore, 75 percent and 50 percent apiece of the respondent firms in Fabricated Metals and Products, Chemicals and Plastics and Rubber Products sub-sectors disclosed that their supplies of raw materials were imported mainly from South Africa, China, India and the Middle East, due to their non-availability in Zambia.

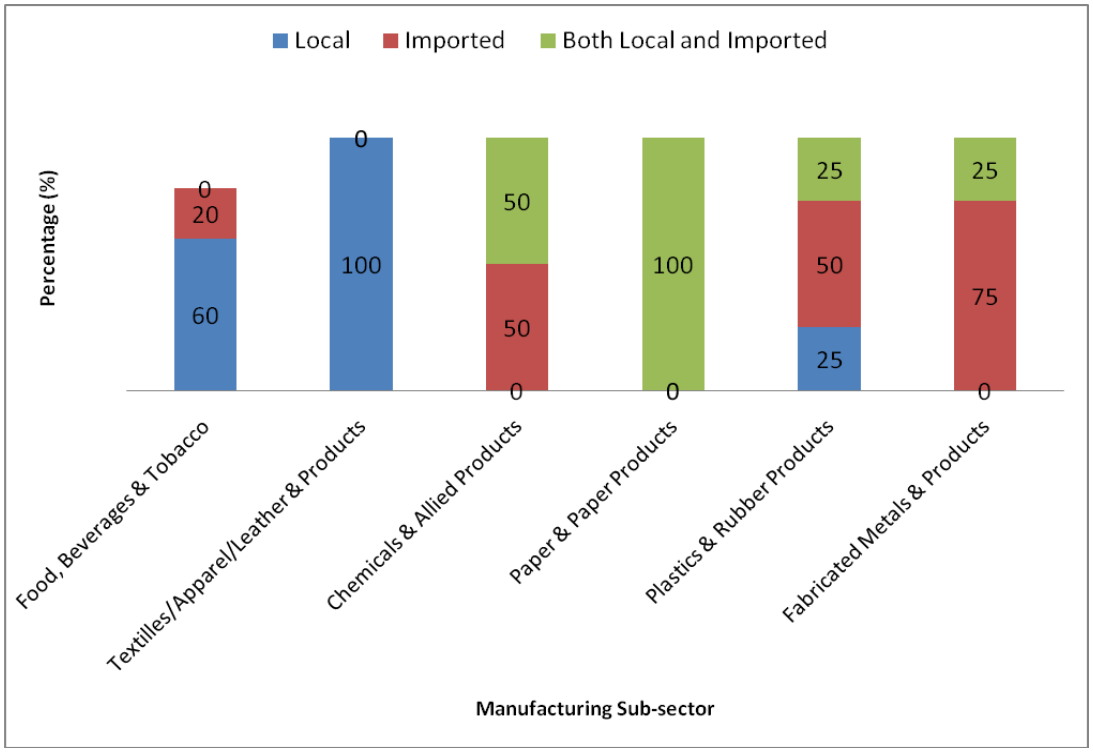


Figure 5.4: Sources of Raw Materials Per Manufacturing Sub-sector

The sources of imported raw materials by the manufacturing sub-sectors surveyed study were categorised as follows:

i. Food, Beverages and Tobacco sub-sector imported directly from RSA and India, where raw materials were not available locally;
ii. Plastics and Rubber Products and Paper and Paper Products sub-sectors imported their raw materials mostly from USA, Germany, China, RSA and Kenya; and
iii. Fabricated Metals and Products firms imported aluminium circles and Zinc from RSA, Tanzania, Kenya, Botswana, India and the Middle East.

Nearly all the machinery and equipment used in production processes were imported either from RSA, China, India or the UK. Most firms complained of high import duties, transportation costs and VAT which affected the prices of the locally produced goods.

5.2.4.2 Modes of Transportation of Inputs

The study revealed that the most preferred mode of transporting the inputs was by road (72 percent), followed by marine and air at 21 percent and 7 percent, respectively (refer to Figure 5.5). The main reason cited for use of road was that it was cheaper than air despite the long lead time.

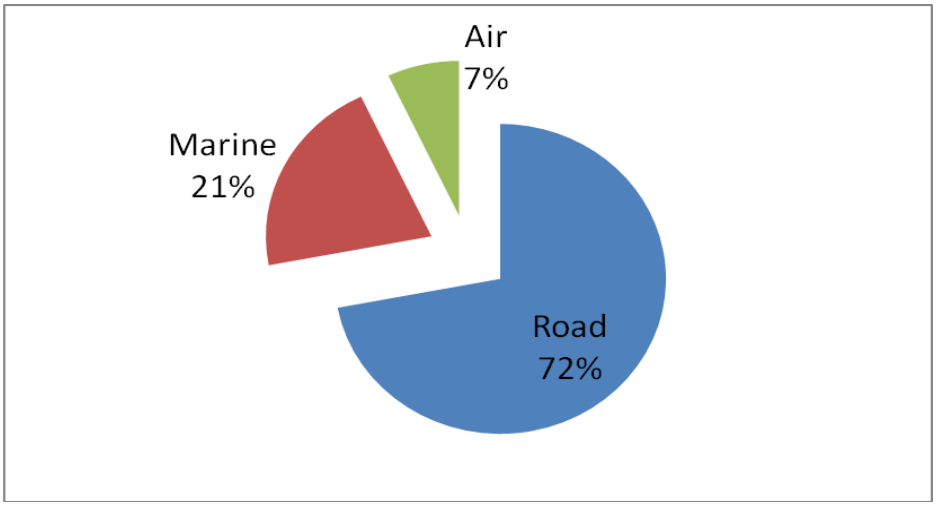


Figure 5.5: Modes Transportation of Inputs

5.3 Awareness and Knowledge of MFEZs and/or IPs in Zambia

The study revealed that all of the CEOs and other firms' representatives contacted such as CAMs, HRMs and TMs, had heard of the MFEZs and/or IPs concept at least from electronic and print media, except in the Food, Beverages and Tobacco, Textiles, and metal fabrication sub-sectors, where 20 percent, 50 percent and 25 percent of the respondents, respectively, indicated that they were not aware of any zones or parks being constructed in Zambia. The results are shown in Figure 5.6.

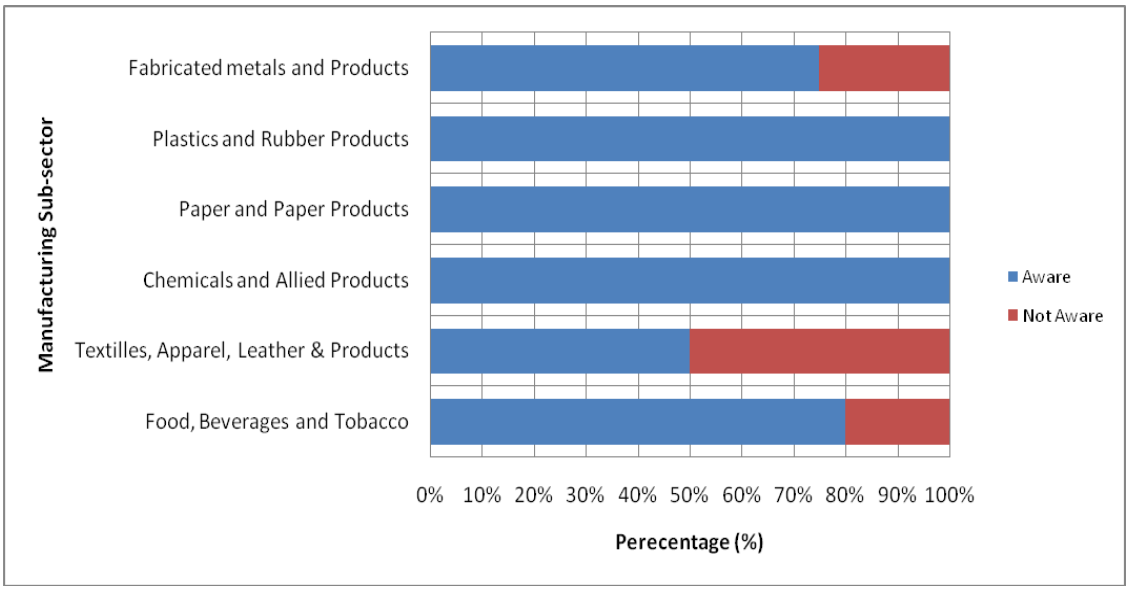


Figure 5.6: Awareness of MFEZs and IPs in Zambia

On the other hand, the study revealed that all the respondent firms' CEOs except 50 percent and 20 percent apiece of those in the Textiles, Apparel and Leather products, and Food, Beverages and Tobacco in Plastics and Rubber and Fabricated Metals and Products sub-sectors, respectively, disclosed that they were aware of/or had at least heard of the MFEZs and/or IPs being constructed in Zambia. They even acknowledged that the MFEZ/IP was a good concept, whose expectations included; enhancing value-addition to locally-produced raw materials, increasing productivity and the quality of locally-manufactured products, easy access to suppliers of consumables and spare parts and networking of companies. However, respondents in the Textiles (50 percent), metal fabrication (50 percent) and Paper and Paper Products (only respondent) sub-sectors

were not sure of what benefits zones and parks would bring. Where as 40 percent of respondents in the Food, Beverages and Tobacco sub-sector branded MFEZ/IP as bad initiative, 100 percent of the respondent in the extraction of primary metals were very certain that the concept would realise spill-over benefits such as reduction in the cost of manufacturing and transfer of technology.

As shown in Figure 5.7, the survey revealed that nearly all the manufacturing sub-sectors studied, except 20 percent and 25 percent of the respondent firms in the Food, Beverages and Tobacco, and Plastics and Rubber Product sub-sectors, respectively, indicated that it was of greater importance to effect enforceable policies on the ratios of expatriates to locals employed in MFEZs/IPs. However, 25 percent of the respondent firms in the metal fabrication sub-sector indicated that it was not important to introduce such enforceable policies as they would discourage potential investors. None the less, it was a general view that in order to facilitate transfer of skills and knowledge, the Zambian Government should enact enforceable policies (labour laws) in the MFEZs/IPs.

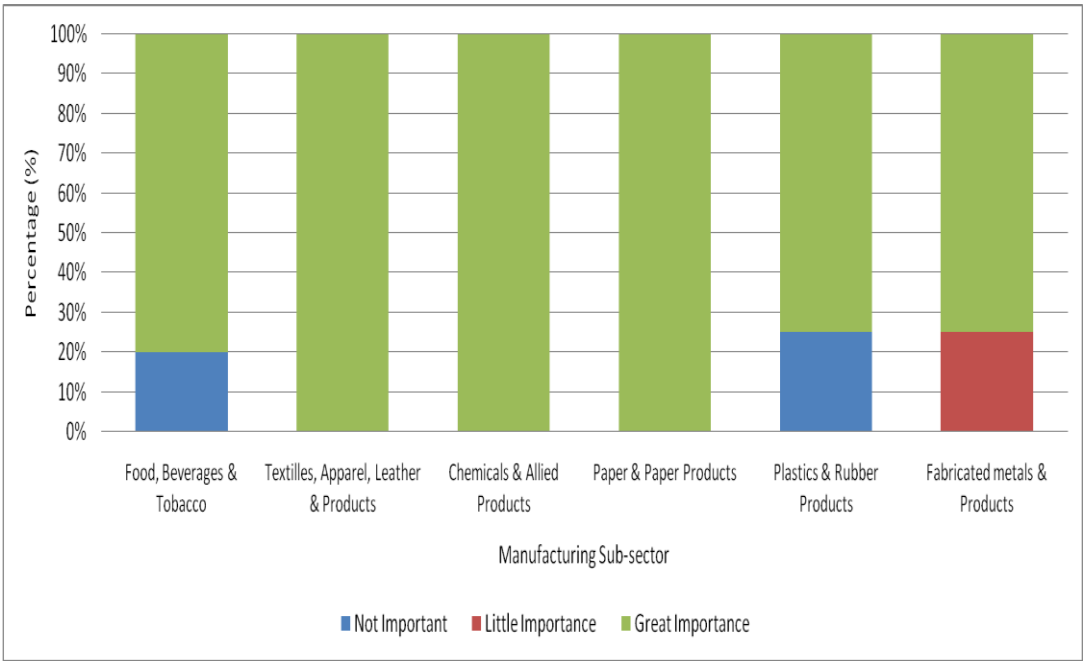


Figure 5.7: Importance of Enforceable Policies on Expatriates to Local Ratios in the MFEZs/IPs

5.4 Location of Respondent Firms and Level of Development of MFEZs and IPs

Figure 5.8 illustrates the zones' and parks' preferences of the respondent firms. The study revealed that the most preferred zone was Lusaka East or Sub Zone attracting 50 percent each of the firms involved in the production of plastics and rubbers products, chemicals and allied products and textiles, apparel and leather products, and 20 percent respondent firms in food, beverages and tobacco sub-sector. The Chambishi MFEZ was most preferred by firms in the extraction of primary metals (100 percent), Chemicals and Allied products (50 percent) and Fabricated Metals and Products (25 percent) sub-sectors. Lusaka's Roma Industrial Park was appropriate to the only respondent firm in the Paper and Paper Products sub-sector, and the respondent firms in the Fabricated Metals and Products (25 percent), Plastics and Rubber Products (25 percent) and the Food, Beverages and Tobacco (20 percent) sub-sectors. Then, 20 percent and 25 percent of the companies dealing in foods, beverages and tobacco processing, and metal fabrication, respectively, opted for the Lusaka South Zone.

However, none of the respondent organisations preferred Lumwana MFEZ, while the Sub-Sahara Gemstone Exchange Park in Ndola received 20 percent response from the Food, Beverages and Tobacco sub-sector. Additionally, 25 percent of the respondent firms involved in plastics and rubber products did not prefer any of the stated zones or parks but opted to be turned into a virtual zone.

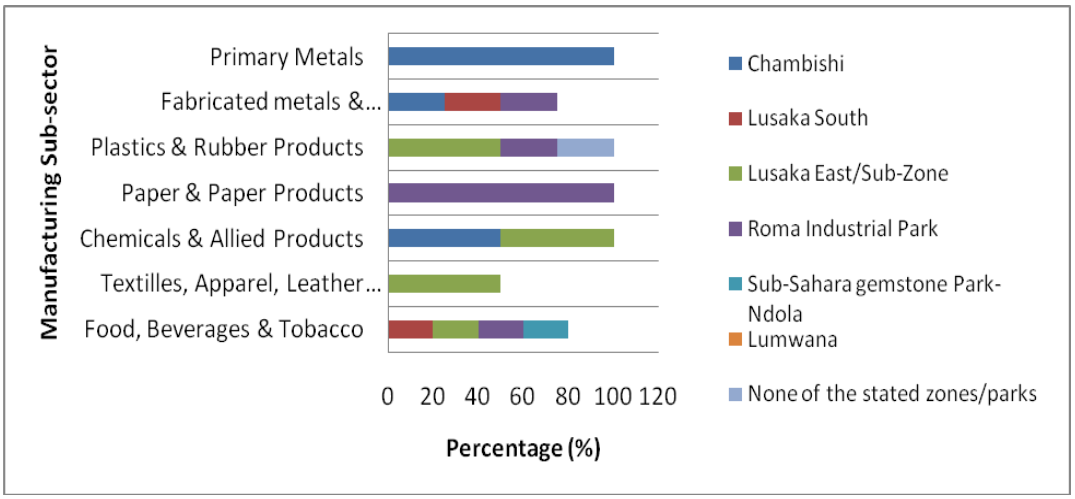


Figure 5.8: Location of Respondent Firms and Level of Development of MFEZs and IPs

5.5 Constraints in the Implementation of MFEZs and IPs Concept

Figure 5.9 illustrates the constraints or difficulties that respondents said would impede the implementation of the MFEZ/IP concept. Like any other new project, the implementation of the MFEZ/IP is expected to face challenges such as little Government support to the locally-owned firms, especially small- and medium-scale firms, as revealed by 59 percent of respondent firms in all the sub-sectors studied, while 20 percent disclosed that the Government seemed to have no clearly defined policy guidelines or frameworks to buttress the implementation of the MFEZs/IPs concept. In the same vein 11 percent of the respondent companies across the manufacturing sector cited lack of knowledge and skills as one of the constraints and 10 percent intimated that most locally-owned manufacturing firms did not have the necessary technology to adopt MFEZ/IP concept and sustain the new innovations.

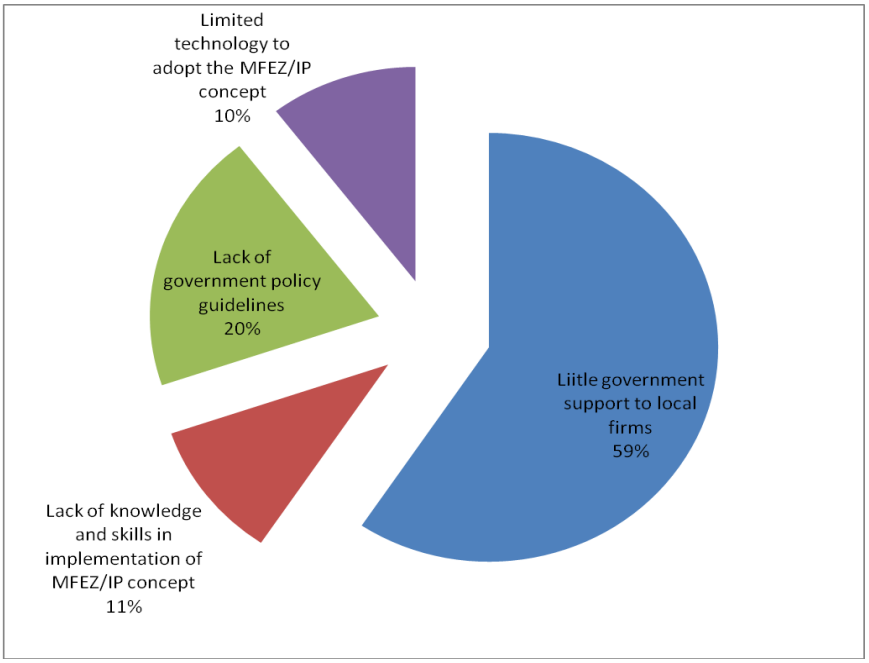


Figure 5.9: Constraints in Implementation of MFEZs and IPs Concept

5.6 Technological Levels, Quality Standards and Productivity

This section presents the findings on the application levels of technologies and manufacturing management systems in industries, physical facilities, market diversification and R&D including added-value services, technical standards, and critical factors, the current skills, knowledge and human resource levels, and their abilities to meet dynamic trends in technology and improve productivity.

5.6.1 Physical Facilities - Machinery and Equipment

Figure 5.10 indicates the classes of machinery and equipment employed in different manufacturing sub-sectors surveyed. The comparison on the investment levels in infrastructure and the corresponding technologies revealed that 100 percent, and 50 percent each of the respondent firms in the Food, Beverages and Tobacco, Textiles, Chemicals, and Plastics and Rubber Products sub-sectors had invested in special-purpose machinery, respectively, while 50 percent of the respondent companies involved in metal fabrication indicated that they employed only general-purpose machinery and equipment. Furthermore, the only respondent firm in the Paper and Paper Products sub-sector and 50 percent each of the respondent firms dealing in

textiles, apparel and leather, chemical and allied products, and plastics and rubber products revealed that they employed both general and special-purpose machinery and equipment in varying extents.

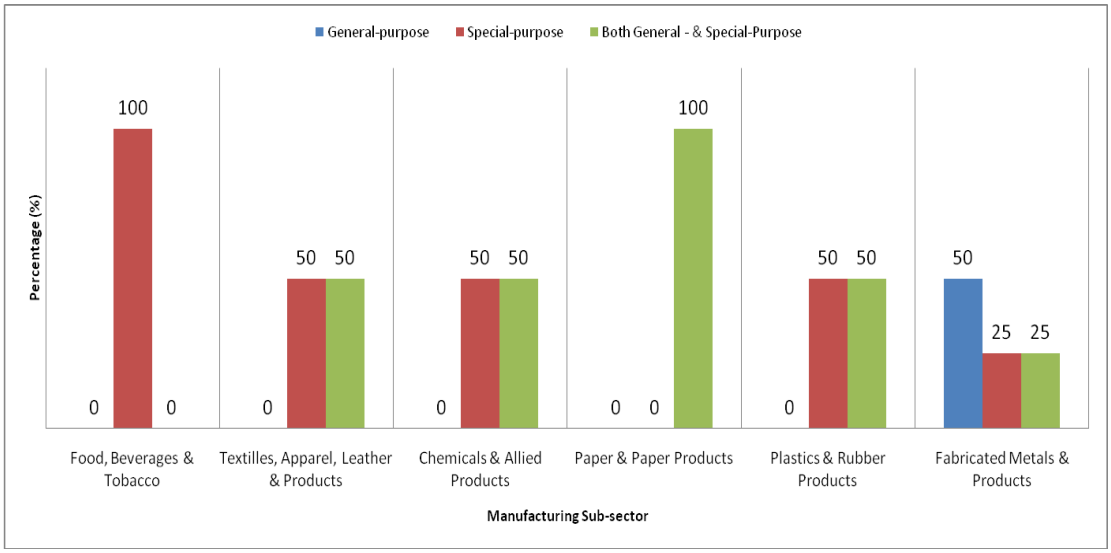


Figure 5.10: Classification of Machinery/Equipment Per Manufacturing Sub-sector

5.6.2 Types of Technologies and Methods of Production Employed in the Sector

5.6.2.1 Design and Engineering Technologies

The level of technology embedded in a machine tool is a major determinant of productivity performance in the manufacturing sector. As illustrated in Figure 5.11, 40 percent, 50 percent and 25 percent of the respondent companies in Food, Beverage and Tobacco, Textiles, Apparel and Leather, and Fabricated Metals and Products sub-sectors, respectively, indicated that their machinery was equipped with advanced manufacturing technologies such as CAD and CAE between 2005 and 2011. However, while 50 percent of the respondent firms in the Chemicals and Allied Products sub-sector indicated that CAD and CAE technologies were not economically feasible, considering the huge capital investment required, lack of skills and the small size of the market available, 20 percent, 50 percent and 25 percent of the respondent companies in Food, Beverages and Tobacco, Textiles, Apparel and Leather, and Fabricated Metals and Products sub-sectors, respectively, disclosed that they had

planned to install these technologies in the next 2 years. One evident feature revealed in the study was that the only respondent firm in Paper and Paper Products, and another 50 percent of the respondent firms in Plastics and Rubber Products sub-sectors, had indicated that the installation of CAD/CAE technologies was not applicable in their industries.

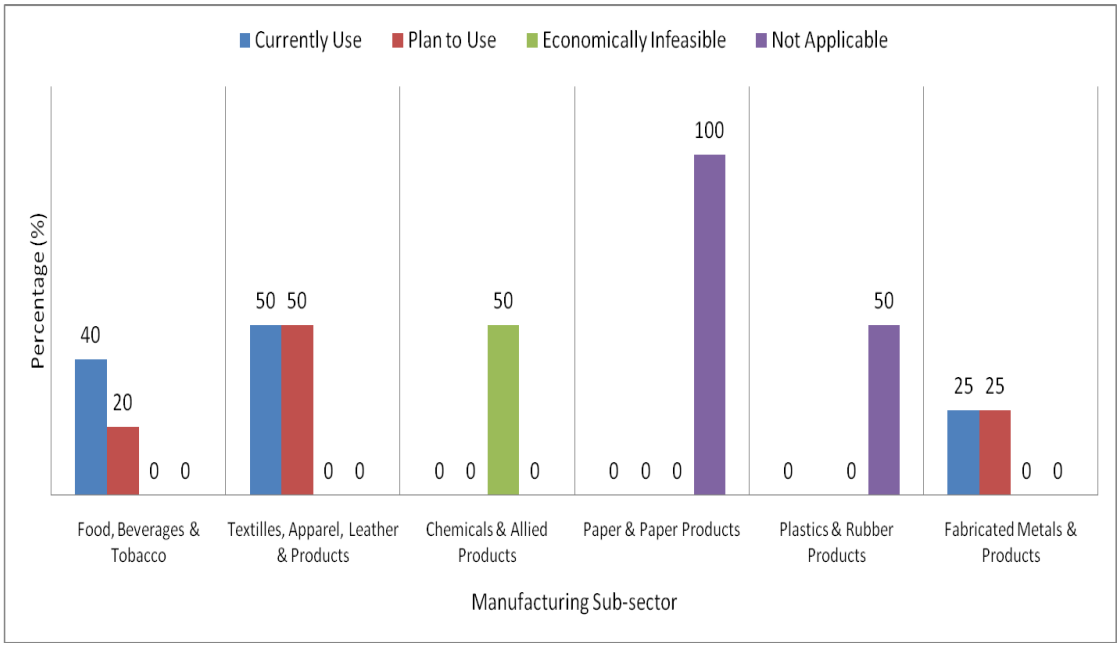


Figure 5.11: CAD/CAE Technologies in Use Per Manufacturing Sub-sector: 2005-11

Notably, in Figure 5.12, the study highlighted that none of the respondent firms in Food, Beverages and Tobacco, Chemicals and Allied Products, Paper and Paper products, and Plastics and Rubber Products sub-sectors had employed CAD/CAM and Simulation or Modelling technologies in their designing and engineeering operations. Other revelations from the survey were that 20 percent apiece of the respondent firms in Plastics and Rubber and Fabricated Metals and Products sub-sectors had invested only in CAD/CAM technologies, where as 67 percent of the respondent in Primary Metals/Mining industry had installed Modelling and Simulation technology.

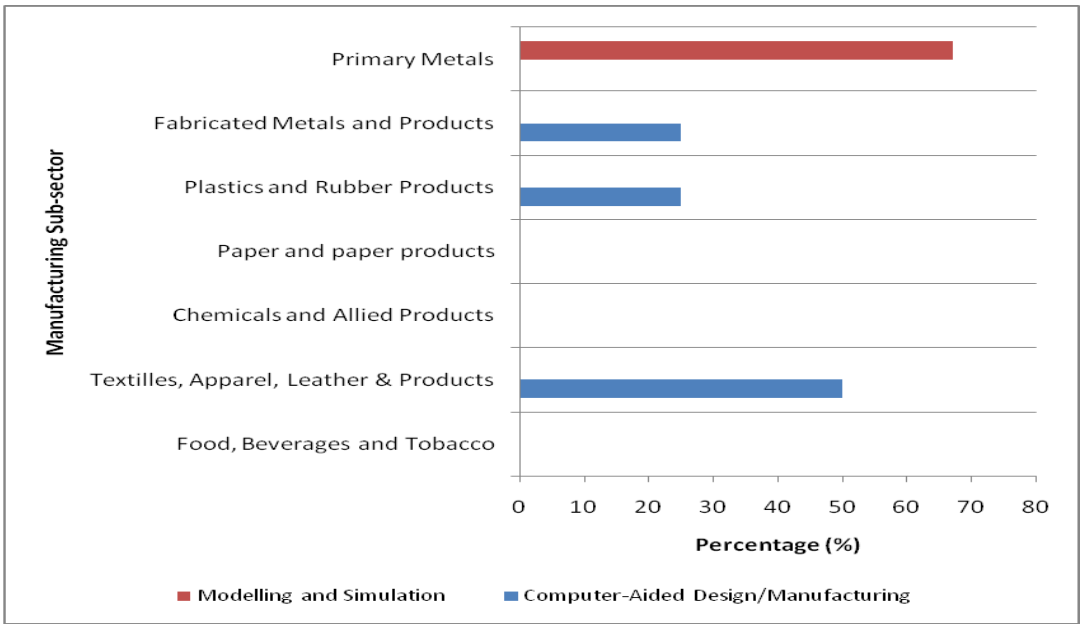


Figure 5.12: Design and Engineering Technologies Per Manufacturing Sub-sector

5.6.2.2 Processing, Assembly, Material-handling and Inspection

Results on the investment levels of technologies employed in processing, assembling, material-handling and inspection operations are shown in Figure 5.13. The study revealed that only the respondent firm in the Paper and Paper Products sub-sector had invested in PLC, Automated Part Identification (bar-coding) and Automated Vision-based Systems, while 20 percent, 60 percent and 40 percent of respondent firms in Food, Beverages and Tobacco sub-sector had installed CNC, PLC and bar-coding systems, respectively. Generally, most of the respondent companies in all the sub-sectors except in the Chemicals and Allied Products sub-sector had made substantial investments in PLC. There was lack of investment in advanced manufacturing technologies such as Robotics, FMS, Automated Storage and Retrieval Systems, Material-handling and Inspection Systems. The study further revealed that 50 percent of respondent firms in the Fabricated Metals and Products sub-sector were still using inherited mechanised machinery from the privatised parastatals installed in the late 1960s, which experienced constant breakdowns.

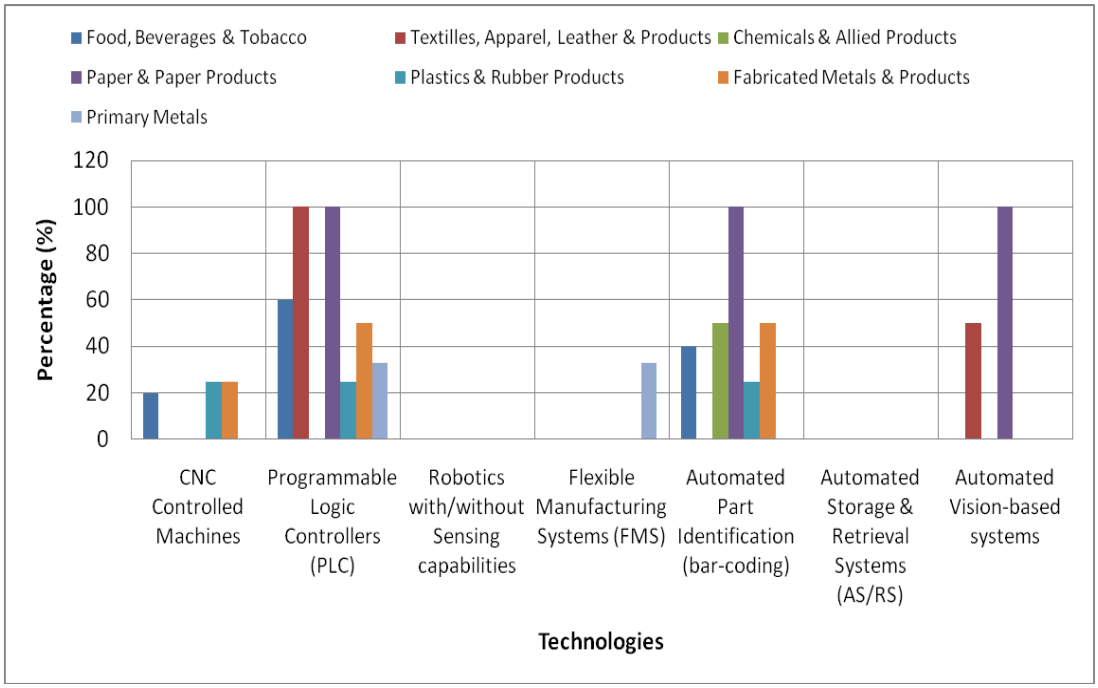


Figure 5.13: Processing, Assembly, Material-handling and Inspection Technologies

5.6.2.3 Information and Communication, Integration and Control

Figure 5.14 shows the information, communication, integration and control technologies used in the local manufacturing firms' operations, where it was revealed that the widely installed technologies in varying percentages were LAN, WAN, CIM and MRP/ERP, in all sub-sectors surveyed except the Plastics and Rubber Products sub-sector. CIM is one step ahead of other technologies as it involves extensive use of computer applications and computer data bases which reduce Manufacturing Lead Time (MLT), design time, production planning time and increase plant utilisation. Use of inspection data in manufacturing control and the Fieldbus system, which uses digital-remotes to control the obnoxious production processes were only installed in 33 percent of respondent firms in the Primary Metals sub-sectors. The survey also revealed that while all the respondent firms in the manufacture of chemicals and other allied products had not installed any of afore-mentioned technologies, 20 percent, 50 percent and 67 percent of the respondent firms in the processing of food, beverages and tobacco, textile and primary metals extraction, respectively, indicated that they were

using Electronic Data Interchange (EDI) and Extranet for purchasing and marketing activities.

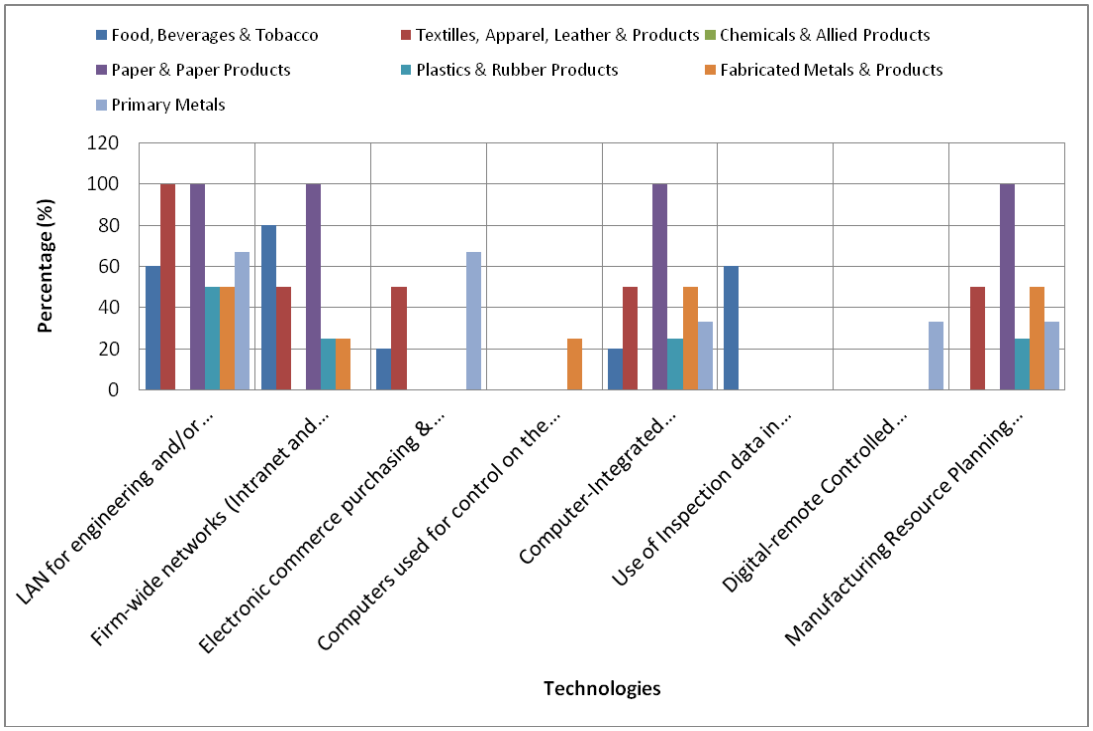


Figure 5.14: Information, Communication, Integration and Control Technologies

5.6.3 Technological Innovations and Market Diversification

5.6.3.1 Innovations, Practices and Manufacturing Management Systems

These systems refer to such techniques as Teamwork and Cross-functional designs, Flatter organisational structures, JIT, Lean Production, TQM, Benchmarking and Process Re-engineering (BPR) among others, which increase business performance.

Referring to Figure 5.15, the study revealed that teamwork or cross-functional designs, TQM systems and flatter structures were widely used in Food, Beverages and Tobacco, Textiles, Plastics and Rubber, and Chemicals and Allied Products sub-sectors, with responses of 60 percent, 100 percent, 50 percent and 75 percent, respectively. The study also disclosed that Lean Production, Statistical Process Control (SPC) and BPR were in place only in Chemicals and Allied Products (50 percent), Food, Beverages and Tobacco (20 percent), and Textiles (50 percent) sub-sectors. Evidently, while the

respondent organisations in the Food, Beverages and Tobacco, Textiles, Plastics and Rubber, and Chemicals and Allied Products sub-sectors disclosed that they had installed almost all innovative systems under consideration, as shown in Figure 5.15, the only respondent company in the Paper and Paper Products sub-sector was only using Teamwork, TQM and Cellular Manufacturing systems. However, the Paper and Paper Products sub-sector indicated that plans were underway to employ best practices such as Continuous Improvement and Problem-solving, JIT inventory control, Electronic Kanban, Benchmarking and Lean Production in the next 2 years.

Furthermore, only 40 percent and 50 percent apiece of the respondent firms in the processing of foods, beverages and tobacco, textiles, apparel and leather as well as metals, chemicals and allied products, respectively, revealed that they had been using Distribution Resources Planning (DRP) technique and the internal Benchmarking technique only, for fear of being disadvantaged by their competitors, due to information exchange in external benchmarking.

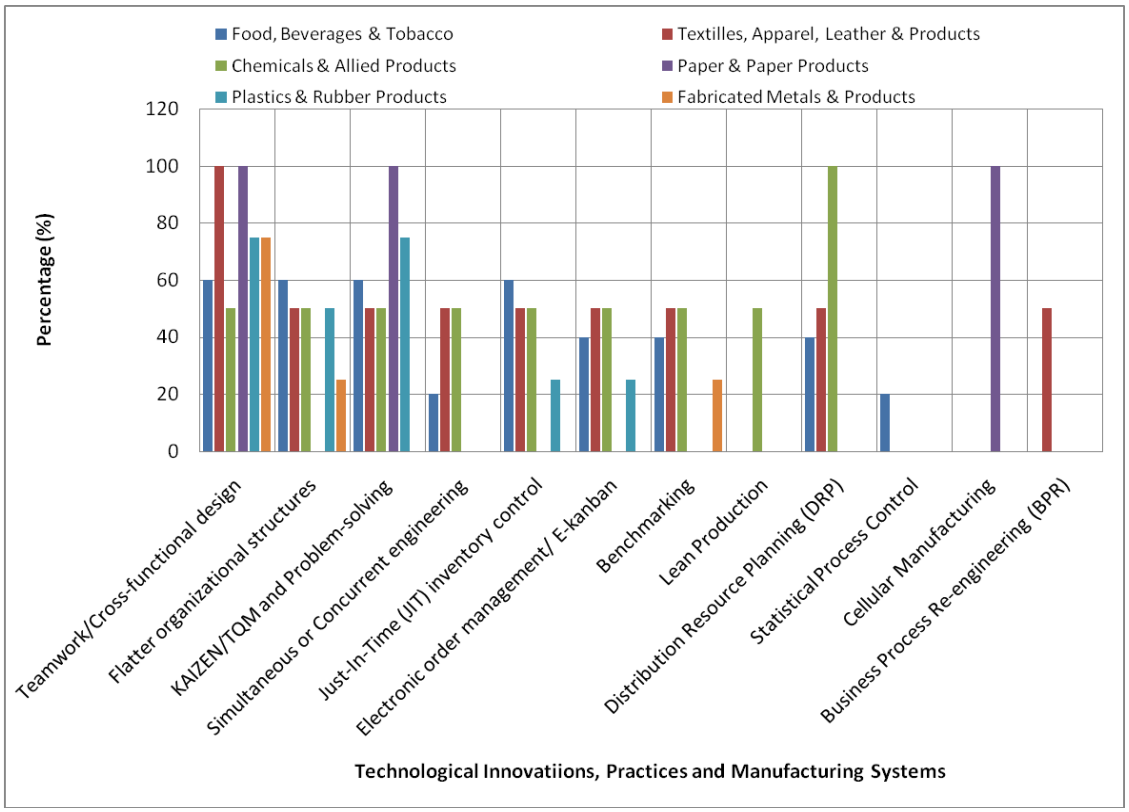


Figure 5.15: Technological Innovations, Practices and Manufacturing Systems

5.6.3.2 Added-Value Services

Figure 5.16 shows the added-value services offered in different manufacturing sub-sectors, where 100 percent apiece as well as 60 percent of the respondent firms in the Chemicals and Fabricated Metals and Products, and Food, Beverages and Tobacco sub-sectors, respectively, disclosed that they offered the said services to their customers. It was also disclosed from the research study that the only respondent firm in the Paper and Paper sub-sector and 75 percent of the respondent firms in the Plastics and Rubber Products sub-sector did not offer any added-value services but had plans to begin offering the said services in the next 2 years. However, the research revealed that 100 percent, and 20 percent of the respondent firms in the Textiles, Apparel and Leather Products, and Food, Beverages and Tobacco sub-sectors, respectively, had indicated that they neither offered any added-value services nor had any plans to commence in the immediate future.

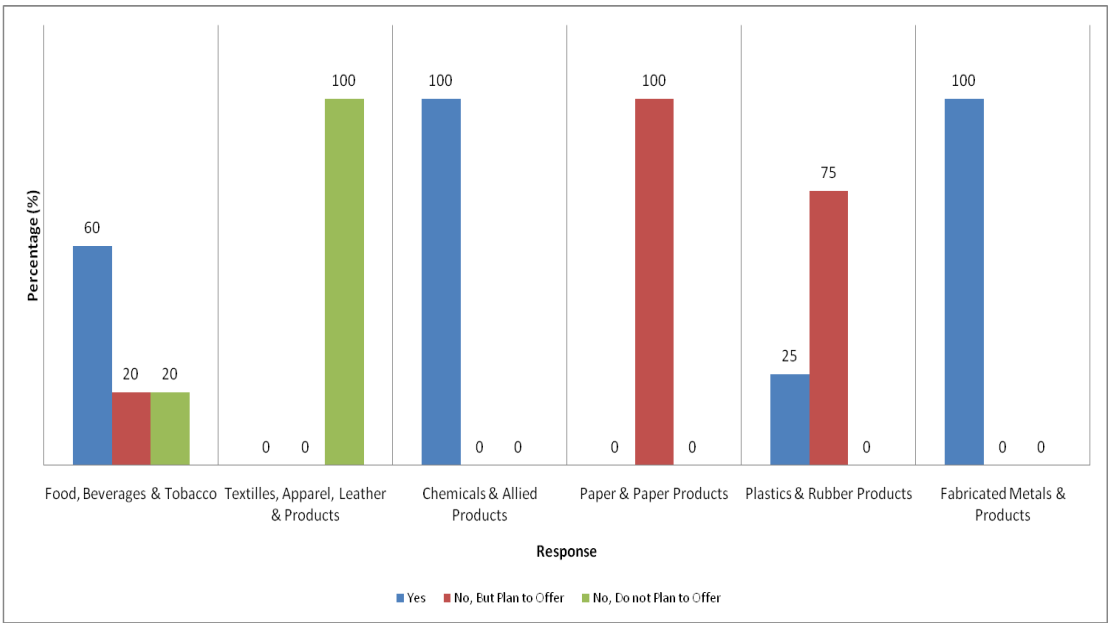


Figure 5.16: Added-value Services Per Manufacturing Sub-sector

From personal interviews conducted with CEOs, Technical Managers and CAMs, specifically relating to whether the firm owned any patent, whether the firm had developed a new product in the last 2 years, what percentage of sales revenue was allocated to R&D expenditure, and what percentage of employees worked in R&D, it

was revealed that none of the firms put much emphasis on in-house designing (R&D) as the number of employees in R&D area was non-existent or negligible (about 0.12% of the total work-force). Further enquiries revealed that R&D was not encouraged in most firms, as no or weak links existed between firms and the institutions of learning and research centres, such as colleges, universities, National Technology and Business Centre (NTBC) and National Institute for Scientific and Industrial Research (NISIR). 25 percent apiece of respondent firms involved in plastics and rubber products and food, beverages and tobacco processing indicated that their shareholders opposed to any significant investments in R&D because there were no immediate returns on investment, as the lead times were quite long.

5.7 Technical Standards

Referring to Figure 5.17, the survey disclosed that 60 percent and 50 percent of respondent firms in the Food, Beverages and Tobacco, and Plastics and Rubber Products sub-sectors, respectively, indicated that they were trading with quality certified suppliers, while 50 percent apiece in the Textile, Apparel and Leather products and Fabricated Metals and products sub-sectors, as well as 20 percent and 25 percent in the food, beverages and tobacco, and chemicals processing sub-sectors, respectively, were plant quality certified with both ISO 9000 and ISO 14000, the Environmental Management System, between 2001 and 2005. The most evident revelation was that the only respondent firm in Paper and Paper Products sub-sector did not have any quality certification scheme at all. Furthermore, 50 percent of the respondent firms in the Chemicals and Allied Products sub-sector and 25 percent in the Plastics and Rubber Products sub-sector indicated that they were certified with SADC and COMESA-Harmonised standards. All in all the most common quality certification schemes in most local manufacturing firms were ISO 9000 (QMS) and ISO 14000 (EMS).

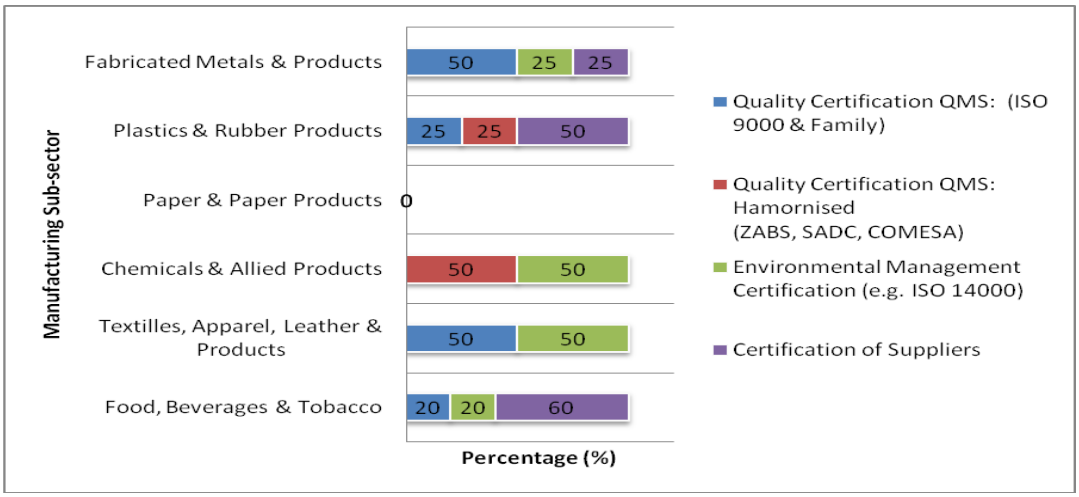


Figure 5.17: Quality Certification Schemes Per Manufacturing Sub-sector

5.7.1 Impact of Quality Certification Schemes

As illustrated in Figure 5.18, the survey revealed that 66 percent and 12 percent of the respondent firms on aggregated basis disclosed that quality certification schemes had a positive impact on the overall status of the firm as they improved the market share and tended to reduce the costs of manufacturing, respectively. While 11 percent of the respondent companies indicated that these schemes improved worker productivity, another 11 percent indicated that the schemes did not have any impact on the overall status of the firm.

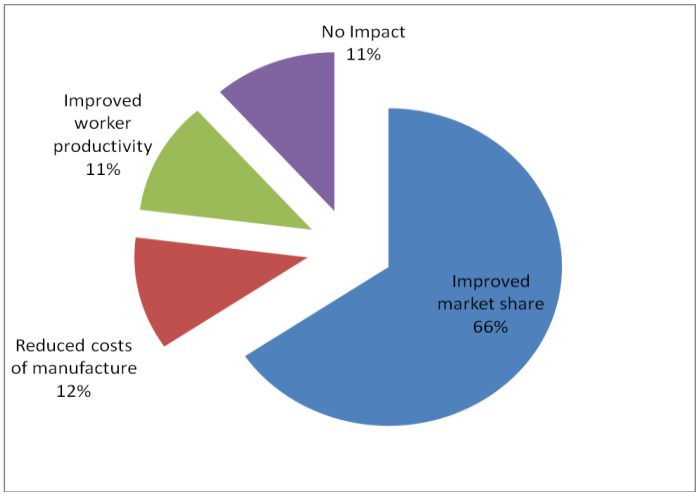


Figure 5.18: Impact of Quality Schemes on Overall Status of the Firm – Aggregated Manufacturing Sub - sectors

5.7.2 Expectations of Employing Quality Certification Schemes

Additionally, Figure 5.19 shows the expectations of employing quality certification schemes, in which 71 percent of the respondents firms in all manufacturing sub-sectors surveyed disclosed that they expected that the quality schemes would enhance the manufacture of competitive products, 11 percent indicated that these schemes would in turn increase sales volume and another 12 percent disclosed that the quality certification schemes would increase customer's wider choice. However, 6 percent of the respondent firms indicated that they were non-expectant of anything from quality certification schemes.

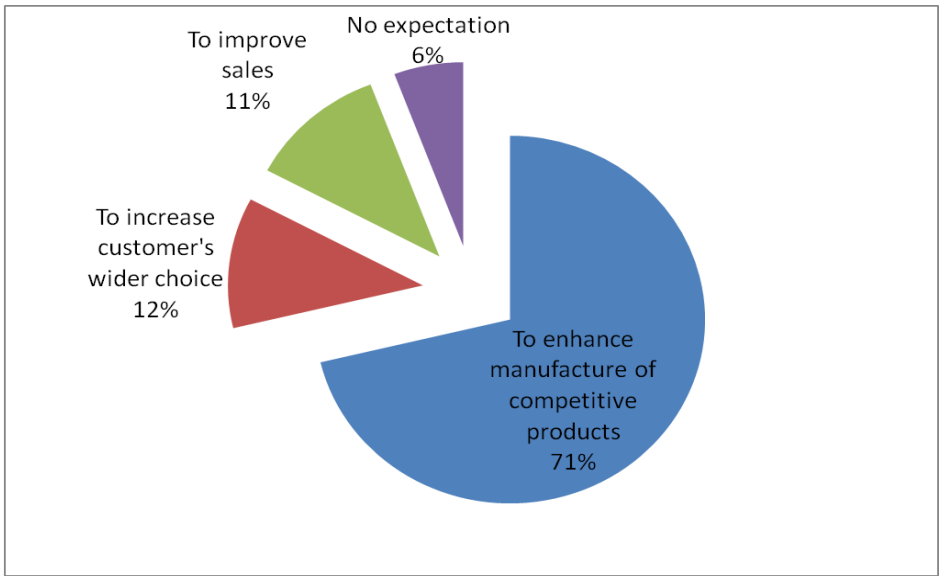


Figure 5.19: Expectations of Employing Quality Certification Schemes - Aggregated Manufacturing Sub-sectors

5.8 Targeted Market for Finished Products

As illustrated in Figure 5.20, 100 percent of the respondent companies in Textiles, Apparel and Leather Products, Plastics and Rubber Products and Fabricated Metals and Products sub-sectors revealed that they targeted both local and foreign markets for their finished products, while 20 percent in the Food, Beverages and Tobacco sub-sector, 50 percent in the Chemicals and Allied Products sub-sector and the only respondent in the Paper and Paper Products sub-sector indicated that until they satisfied the local market they would not venture into export markets of their products. The survey also revealed

that 20 percent of the respondent companies in food, beverages and tobacco processing targeted only export markets for their finished products.

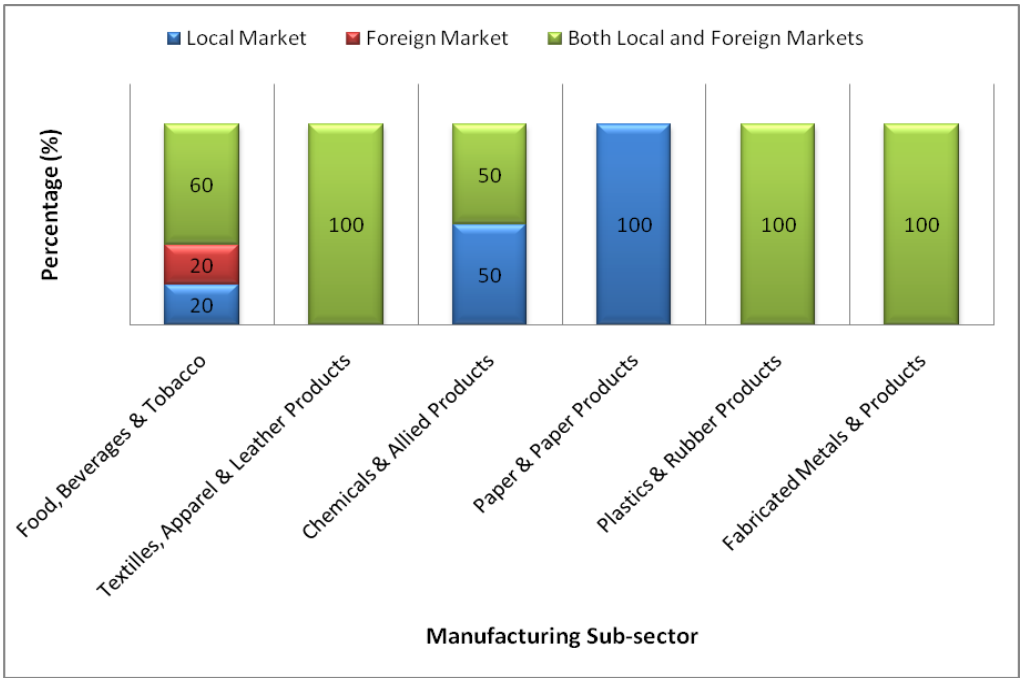


Figure 5.20: Targeted Market for Finished Products Per Manufacturing Sub-sector

5.9 Critical Factors in the Manufacturing Firm's Business Strategy

Figure 5.21 depicts the PARETO Curve that classifies some of the critical factors in the business strategy. According to the results, 62 percent of the respondent firms in aggregated sub-sectors revealed that 27.3% of the critical factors (vital few) such as investments in advanced technologies, reduction in the manufacturing costs, improvements in the manufacturing processes and existing products, and developing new products, had 72.7% impact on the achievement of business strategies and objectives. In addition, 38 percent of the respondent firms disclosed that 72.7% of the critical factors (referred to as 'trivial many') like using team-based manufacturing systems like cross-functions and flatter structures, improvements in marketing activities, personnel strategies such as staff training and pay-for-skills, entering new markets, added-value services like customer training and after–sales services, using

new materials and investment in information technology systems had little effect (27.3%) on the performance of the manufacturing firms.

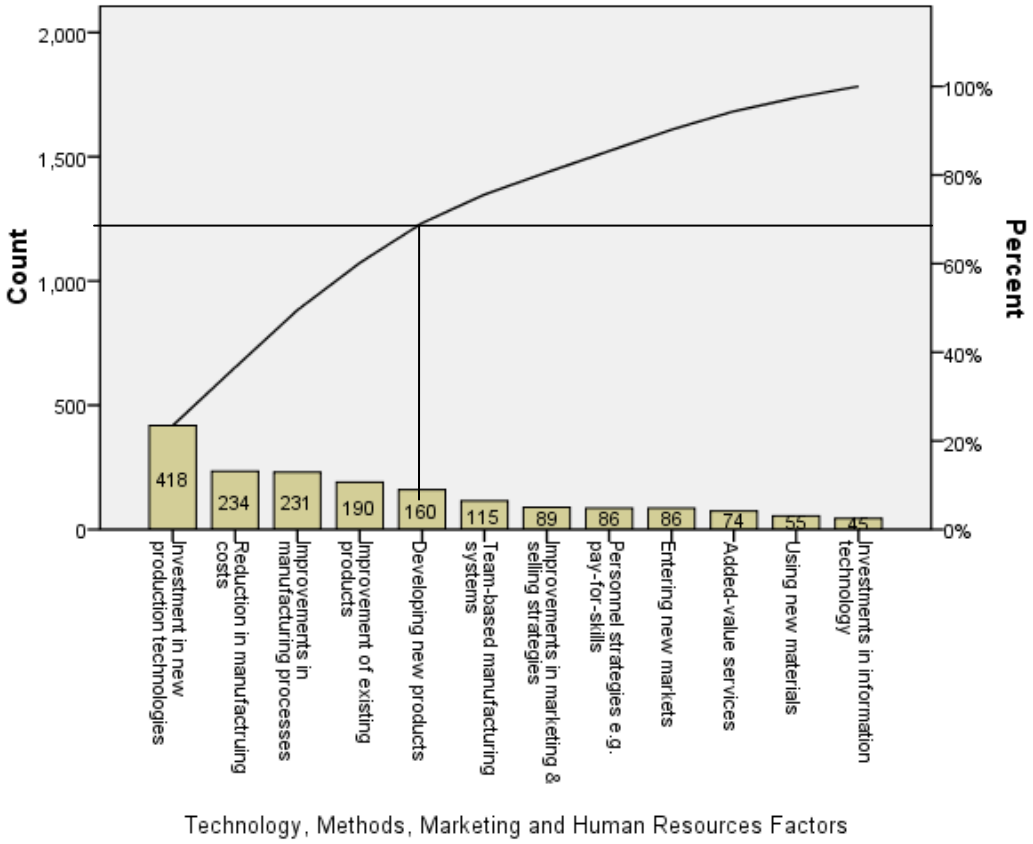


Figure 5.21: Importance Levels of Critical Factors in the Firm's Business Strategy - PARETO Curve

5.10 Human Resource Development–Skills, Knowledge and Managerial Capabilities

5.10.1 Human Resource Development

Most companies' representatives indicated that they did not have medium- to long-term plans for their employees especially at shop-floor, as shareholders were more concerned with profit maximisation.

5.10.2 Annual Labour Turnover

Referring to Figure 5.22, the annual labour turnover generally stood at less than 10% in almost all the respondent companies in the manufacturing sub-sectors surveyed, which

encouraged internalisation and specialisation of skills, as well as the human capital accumulation.

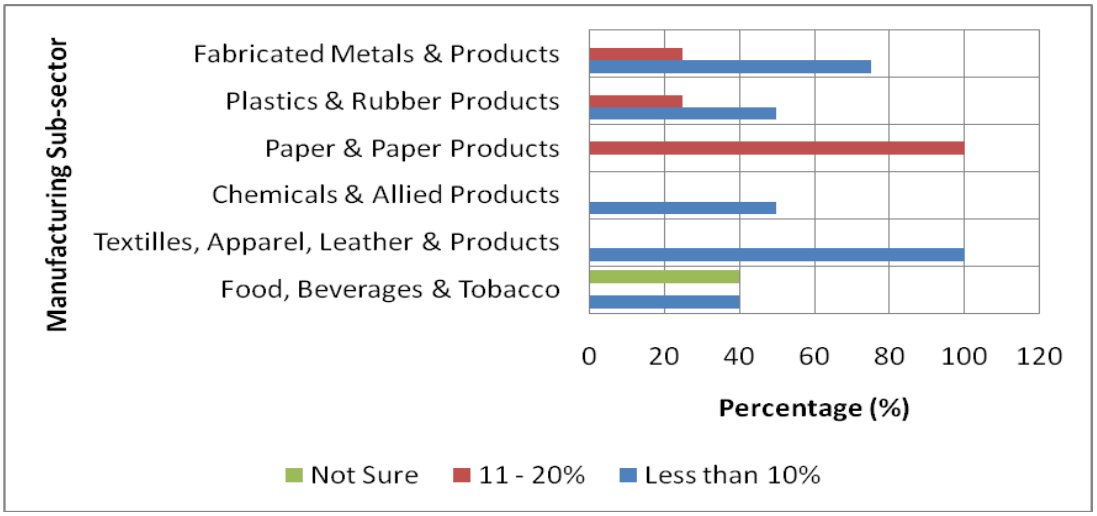


Figure 5.22: Annual Labour Turnover Per Manufacturing Sub-sector

Evidently, based on Figure 5.22, with the exception of the only respondent firm in the production of paper and other paper products and 25 percent apiece involved in metal fabrication and plastics and rubber products, which indicated that annual labour turnover ranged between 11% and 20%, 40 percent of respondents firms in Food, Beverages and Tobacco processing sub-sector revealed that they were not sure of their firms' annual labour turnover.

5.10.3 Employment Categories and Ratios

The average employment ratios of locals to expatriates in terms of specialisation, across all manufacturing sub-sectors surveyed, are presented in Figure 5.23, where, 6 to 1 represents the ratio of workers employed in production/manufacturing department, while human resource and purchasing departments had a 4 to 1 ratio. Engineers' ratio was 5 to 1, with Technologists and Technicians' ratio standing at 7 to 1, and Artisans' and craftsmen's ratio was 21 of the local workers to 1 of the expatriates.

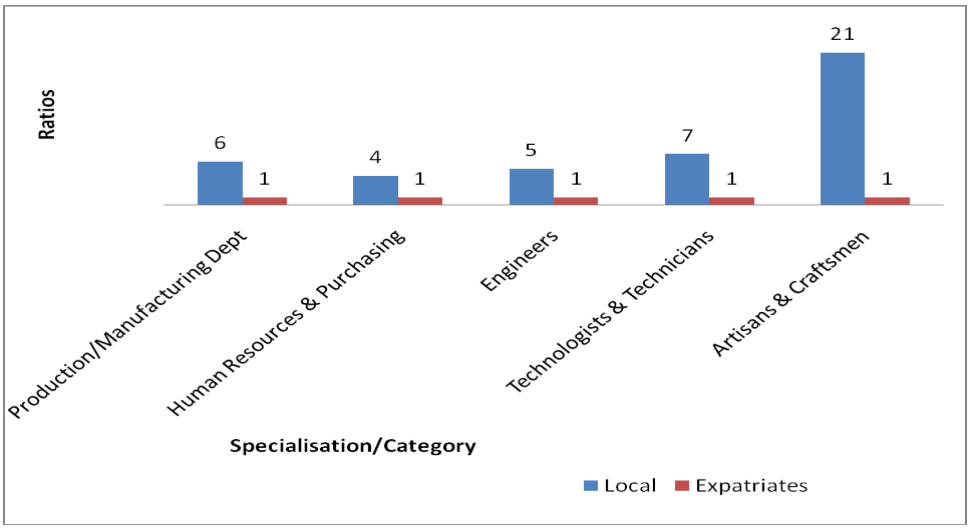


Figure 5.23: Employment Ratios (Local to Expatriates) - Aggregated Manufacturing Sub-sectors

One striking feature worth noting is that 33 percent of the respondent firms in the Fabricated Metals and Products sub-sector revealed that they were neither local Engineers nor Technologists employed, and the number of local Technicians was less than that of expatriate ones, standing at 1 of the locals to 3 expatriates.

5.10.4 Levels of Education and Professional Qualifications

Figures 5.24, 5.25 and 5.26 show the percentages of educational and professional qualifications at different levels of an organisation. At managerial level, the study revealed that with the exception of 20 percent of the respondent firms involved in processing food, beverages and tobacco, almost all members of staff possessed Degree qualifications (Figure 5.24). Figure 5.25 shows levels of education and professional qualifications at middle and supervisory level, in which almost all respondent firms in aggregate terms revealed that they had employed only Diploma holders, except 20 percent of the respondent firms in Food, Beverages and Tobacco sub-sector which indicated that even Craft certificate holders were considered for supervisory duties, depending on experience.

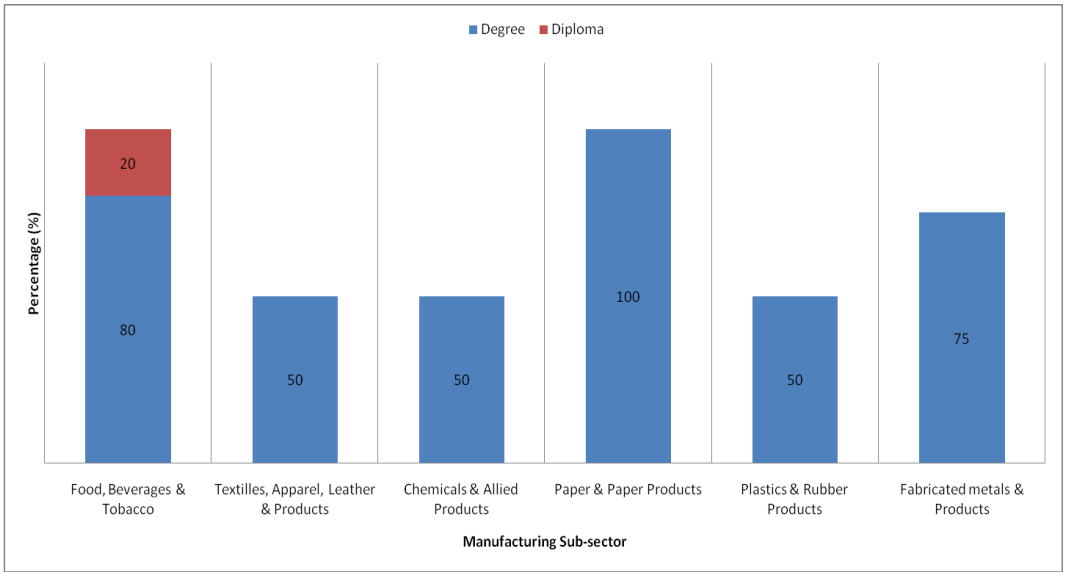


Figure 5.24: Educational/Professional Qualifications at Managerial Level Per Manufacturing Sub-sector

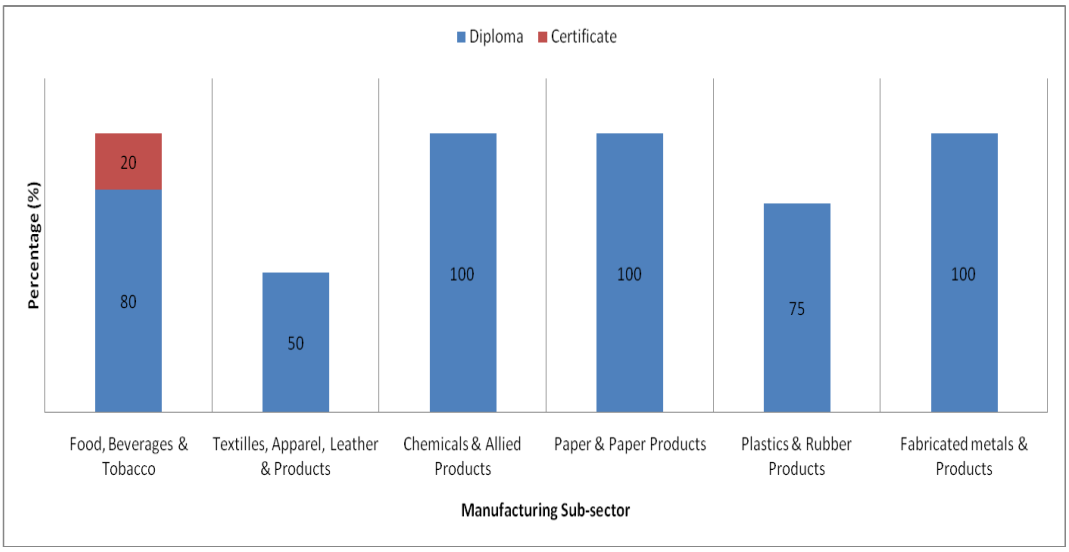


Figure 5.25: Educational /Professional Qualifications at Supervisory Level Per Manufacturing Sub-sector

Furthermore, the study revealed that 75 percent apiece and 40 percent of the respondent firms in Plastics and Rubber Products and metal fabrication, and Food, Beverages and Tobacco processing sub-sectors, respectively, and the only respondent firm in the Paper and Paper Products sub-sector, indicated that they engaged Craft certificate holders in the specialised works at shop-floor level, while 50 percent respondent organisations in textiles, apparel and leather production opted to employ Diploma holders (Figure 5.26).

Any other qualifications were also being considered at shop-floor level, according to revelations from 40 percent, 50 percent and 25 percent of the respondent firms in Food, Beverages and Tobacco, Chemicals and Allied Products, and Fabricated Metals and Products sub-sectors, respectively.

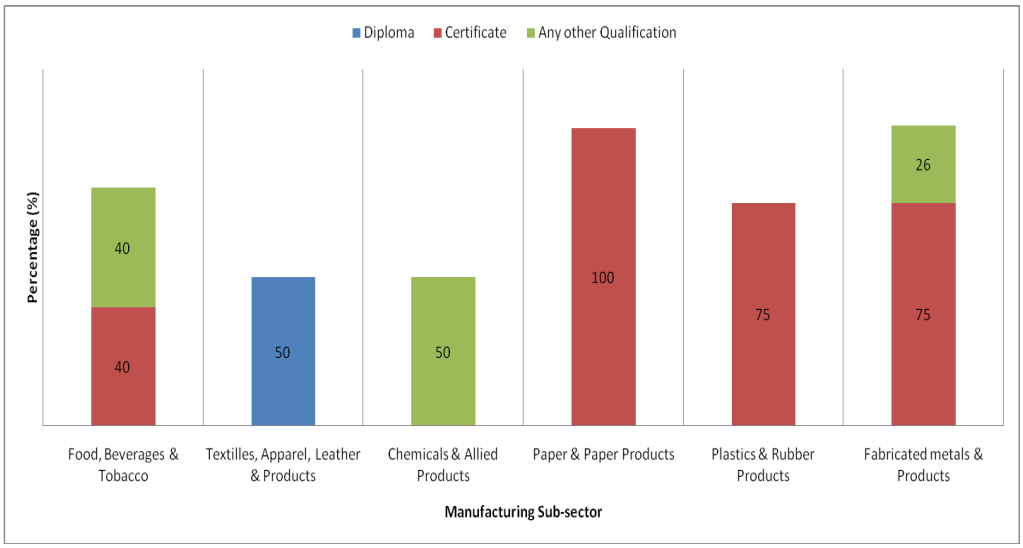


Figure 5.26: Educational/Professional Qualifications at Shop-floor Level Per Manufacturing Sub-sector

5.10.5 Decision-Making Structure and Empowerment

In decision-making process, the survey disclosed that in aggregate terms 76 percent of the respondent firms employed a centralised system whilst 24 percent had decentralised the process, as shown in Figure 5.27.

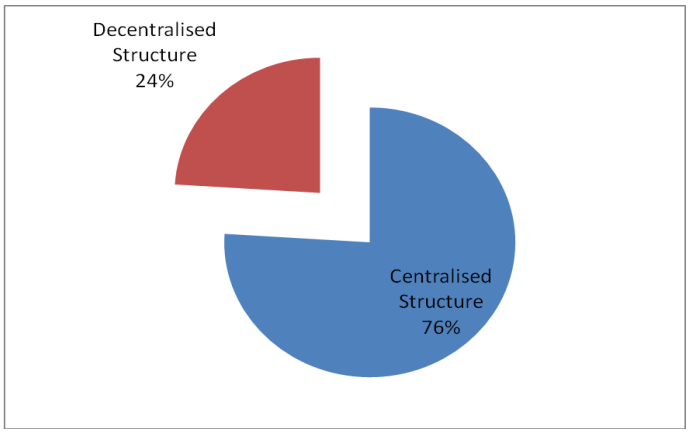


Figure 5.27: Structure of Decision-making Process - Aggregated Manufacturing Sub-sector

5.10.6 Staff Training and Career Development Programmes

Figure 5.28 reveals that 71 percent of the respondent firms in all manufacturing sub-sectors surveyed indicated that they had staff training and career development programmes in place, where as 29 percent revealed that they had none and depended entirely on the general labour market and institutions of learning such as colleges and universities.

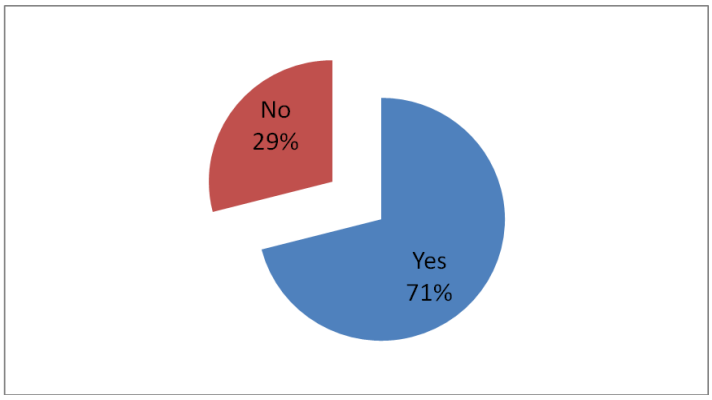


Figure 5.28: Staff and Career Development Programmes: Aggregated Manufacturing Sub-sectors

5.10.7 Methods of Staff Training and Career Development

Figure 5.29 shows the methods of training per manufacturing sub-sector, in which 75 percent, 50 percent apiece and 20 percent of respondent firms in metal fabrication Plastics and Rubber Products and Textiles, Apparel and Leather Products, as well as food, beverages and tobacco processing, respectively, and the only respondent firm in Paper and Paper Products sub-sector, revealed that they preferred on-the-job training only. However, 100 percent of the respondent companies in chemicals production, 60 percent in the Food, Beverages and Tobacco sub-sector, 50 percent in Textiles, Apparel and Leather Products and 25 percent in the Plastics and Rubber Products sub-sectors revealed that they preferred both methods of staff training and career development (off-the job and on-the-job training). It was also discovered from personal interviews that most firms did not have medium- to long-term training plans for their employees especially for shop-floor employees.

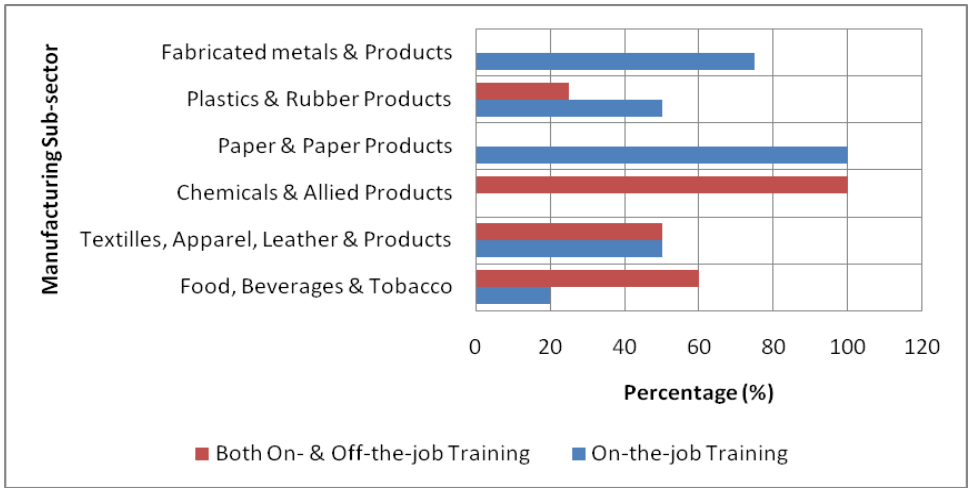


Figure 5.29: Methods of Staff Training and Career development Per Manufacturing Sub-sector

5.10.8 Suitability of Skills to Current Production Technologies Installed

All the respondent firms in the manufacturing sub-sectors surveyed except 50 percent and 20 percent of the respondent companies involved in chemicals and allied products, and food, beverages and tobacco processing, respectively, revealed that the current skills were suitable for the firms' current production technologies (refer to Figure 5.30).

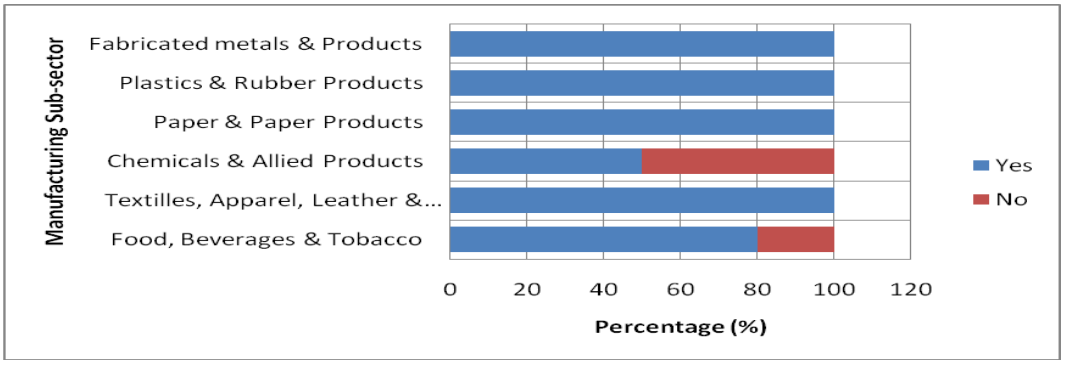


Figure 5.30: Suitability of Skills to Current Production Technologies Per Manufacturing Sub-sector

CHAPTER 6

DISCUSSIONS OF RESEARCH FINDINGS

6.1 Introduction

This chapter discusses the research findings related to the opportunities and challenges of the manufacturing sector in Zambia, in the wake of the MFEZs and IPs. It discusses the results which have been highlighted in chapter 5 and their impact on the possibility of the manufacturing sector in Zambia becoming part of the global manufacturing network.

6.2 Production Lines

From Figure 5.1 it was seen that most of the respondent firms from the manufacturing sub-sector surveyed except in the Chemicals and Allied Products sub-sector revealed that it was more beneficial to maintain few production lines because it was less risky to stick to what you knew and kept things simple. They believed managing fewer personalities throughout few production lines can reduce making errors and lighten the load on the management team. Although they indicated that plans were in place to add a few production lines and/or diversify as market dictated, they were aware of the key factors, namely:

i. Available resources (time and money) required to manage multiple product lines and supply chain vendors for each product line;
ii. Supply chain life-cycle – Whether their current supply chain has room to mature along with their product lines.

iii. Supplier relationships – Whether their current suppliers would help them optimise for each product line, as well as handle the risks that come with adding a new supplier.

6.3 Capacity Utilisation/Productive Efficiency

Capacity Utilisation is an important concept because it is often used as a measure of productive efficiency of the firm, in that as output rises, average production costs tend to fall, thus making a business more competitive. However, one of the main concerns in the manufacturing sector firms in Africa and Zambia in particular since the 1970s, is the low capacity utilisation in manufacturing firms. From the survey, it was highlighted from the survey (refer to Figure 5.2) that capacity utilisation for all the manufacturing sub-sectors surveyed averaged about 75.9 percent which was good, the lowest being 60 percent recorded in the metal fabrication sub-sector. The low productive efficiency were principally attributed to operational constraints such as constant power outages and longer procurement lead times for most of their inputs which were imported from outside the country.

Other reasons given by aggregated respondent firms for the generally low capacity utilisation among the manufacturing firms include:

- Shortage of raw materials locally.
- Insufficient of working capital.
- Low demand for the local products.
- Stiff competition from cheap imported products.
- High cost of raw materials costs of production.
- Unavailability of skilled manpower.

Further revelations from the interviews conducted were that that some firms had not yet fully rationalised their production process as a way of increasing capacity utilisation as some had continued to maintain semi or unused obsolete machinery or production lines inherited from after privatisation. The uncertainties in the business environment and the flooding of cheap foreign products discouraged long term investment in infrastructure.

Electricity as the second most important energy source after coal was also reported to be expensive in comparisons to other countries in the region. The availability, cost and reliability of energy is critical in manufacturing, more so for energy-intensive production industries. The reported constant power outages were mainly due to insufficient power generation capacity both in Zambia and the region. Zambia's main electricity generation is vested in Zambia Electricity Supply Corporation (ZESCO) which produces a larger part of its electric power from hydro-power stations (http:/www.zesco.co.zm). Although the country's hydropower resource potential stands at an estimated 6,000 Mega Watts (MW), ZESCO's installed capacity is only about 1,700 MW, and therefore, at the current estimated demand of 2, 000 MW, and an estimated annual demand growth of 100 MW, the problem of constant power outages is bound to persist (World Bank, 2002).

Therefore, the extraction of domestic energy sources needs to be improved and expanded with a view to increasing energy generation, ensuring better distribution and reducing electricity costs. The Power Rehabilitation Project (PRP) in collaboration with the Zambian Government must invest adequately in power generation projects in order to enable ZESCO to provide electricity at least cost and in an efficient manner to stimulate more and inclusive growth in the economy. Otherwise, several opportunities for value-addition investments will remain a pipe dream, leaving only local market-seeking or local resource-exploitation investments with no interest in export-based activities with less local participation.

6.4 Sources of Inputs and Modes of Transportation

6.4.1 Sources of Inputs

As shown in Figures 5.3 and 5.4, almost all manufacturing sub-sectors under review, with the exception of food, beverages and tobacco producing companies and the Textiles, Apparel and Leather Products sub-sector sourced their inputs, especially primary raw materials, all major spare parts and tools required for machinery from the Republic of South Africa, China, India and the Middle East, due to their non-availability in Zambia. Although most firms were faced with challenges of high

importation duties, huge transportation costs and VAT which affected the prices of their manufactured goods, there were no other alternatives for their imported inputs.

Presented with this scenario, the MFEZ and IP provide investment opportunities for locally-owned manufacturing firms to partner with manufacturing FDIs which are involved in the manufacture of spare parts for various industrial machines, production of inputs for the primary metals/mining sector, food, beverages and tobacco, and textiles, apparel and leather sub-sectors, among others for the domestic and foreign markets. Synergies can also be realised with FDIs which are linked in the production of cotton yarn, engineering and copper-based products for the regional market. For instance, Zambia Metal Fabricators Limited (ZAMEFA) acquired in 1996 by Phelps Dodge Cable and Wire Company of the United States, is one of the biggest manufacturers of copper rods, copper wire and power cables in Southern Africa, and exports 90 percent of its output, most of it (65 percent) to the republic of South Africa. Investment opportunities also exist in packaging materials to supply other industries such as the food processing industry (for packaging material of grain milling, products, sugar, opaque beer, dairy products, cold meats and canned foods) and the chemical products industry (for packaging of; soaps, detergents, cement and fertilizers). Other industries that require packaging materials are leather products, electrical appliances and pharmaceuticals. At present, most packaging materials used by manufacturing companies in the country are imported from the Republic of South Africa, China, India and Europe. Annually, about US$ 30 million is spent on the imports of the packaging materials – this is a clear indication of the huge local demand for these materials in the country, and the investment opportunities arising out of this demand (CSO National Accounts, 2011).

6.4.2 Modes of Transportation

Another major challenge cited in the research is the poor quality of offsite infrastructure like transportation network. From the survey conducted as shown in Figure 5.5, the most preferred mode of transportation of the inputs was by road followed by marine and air. Transport costs accounted for 60 to 70 percent of the cost of production of goods and commodities in Zambia (World Bank, 2002). Therefore,

The Zambian Government must invest adequately in road infrastructure development in order to transform the nation into truly land linked, resulting in reduction of road user costs and transit times across Zambia and create economic growth poles and wealth in outlying areas. It should further give priority to removing the present bottlenecks in air cargo transport, such as reduction of airport landing fees, and give urgent attention to the construction and improvement of the rural road and railway networks, so that the conditions for private investment are improved and the manufacturing export potential is strengthened.

Comparatively, Zambia has two railway lines. Both originate in Livingstone and share a line through Lusaka and Kabwe until Kapiri Mposhi where one line bears east and the other continues north. The TAZARA line bears east on its way to Dar es Salaam, in Tanzania passing through Kasama and Nakonde in Zambia. The TAZARA railway line is designed with a 1067mm-gauge, which is compatible with traffic operations in other Southern African railways, such as Spoornet of South Africa, Botswana Railways, and the National Railways of Zimbabwe, and allows for international transport of passengers and goods. A rail gauge refers to the distance between the lines of a railway or between the wheels of a train. With a designed capacity of five million tons of freight per annum, TAZARA is able to handle traffic for the SADC as well as the COMESA, thereby providing a vital regional conduit and link with Southern, Eastern and Central African regions for Zambia's exports. The other line ZR continues north into the Congo (DR) and connects to Angola, after passing through Ndola, Chingola and several other cities.

6.5 Awareness, Knowledge and Appropriateness of the MFEZs and IPs in Zambia

Almost all the CEOs and other firms' representatives were aware and knew about MFEZs and IPs as illustrated in Figure 5.6. In their understanding, if implemented properly the MFEZs and IPs would enhance value-addition to locally-available raw materials, increase productivity and the quality of locally-manufactured products, and improve networking of local companies. They were very certain that the zones and parks would realise spill-over benefits such as reduction in the cost of manufacturing

and improved transfer of technology and skills to the companies host in the country. Other benefits cited were:

i. More business growth opportunities due to favourable tax incentives;
ii. Employment creation;
iii. Increased productive capacity and industrial synergy;
iv. Stable power supply, reduction in idle manpower and improved industrial environment;
v. Enhancement of local sales on construction materials and reduced logistical problems;
vi. No unprocessed goods or raw materials would be leaving the country; and
vii. Rental savings and increased product and service quality.

The Lusaka East or Sub Zone was the most attractive zone especially to Paper and Paper Products, Food, Beverages and Tobacco, Metal Fabrication, and Plastics and Rubbers Products sub-sectors because, logistically (for inputs and outputs) it was near to the Kenneth Kaunda International Airport (Figure 5.8). The Fabrication Metal and Products sub-sector preferred the Chambishi MFEZ due to its short distance from the source of raw materials (metals), as most of the firms involved in metal extraction (mining) were already located and operating in the Chambishi MFEZ.

6.6 Levels of Technology and Quality Standards

6.6.1 Technologies and Manufacturing Approaches

The TNCs boast of advanced technologies in manufacturing operations such as designing and engineering, fabrication and assembly, automated material handling and storage systems, industrial robots, inspection for quality, manufacturing information systems, integration and control of manufacturing system of the organisation. High local technological capabilities are an important factor for attracting FDIs or TNCs in high value-added activities. According to Alcaraz et al. (2012), investments in advanced manufacturing technologies bring benefits related to techniques and operative aspects namely; reduction of the reprocessing operations and waste (time and material),

competitiveness, improved products quality and reliability, flexibility for better response to production volume changes, knowledge management, product design, and space usage and inventory management, among others.

The degree and efficiency of technology transfer is crucial for host countries' economic growth. According to Blanco de Armas and Sadni-Jallab (2002) cited in Yejoo Kim, (2013), when the host countries' level of technology is similar to that of the home country, the establishment of SEZs is likely to post economic growth. This is closely linked to host countries' human resources development. However, considering the circumstances of Zambia where the levels of technologies, innovations and production approaches are relatively lower than that of the investing TNCs, the local manufacturing industry is faced with many challenges in order to be integrated into MFEZ value chain. Figure 5.12 shows the absence of modelling and simulation technology that is used in designing and engineering operations, while Figures 5.13 and 5.14 depict a clear lack of such modern manufacturing approaches as robotics technology, FMS, automated storage and retrieval systems, material-handling and inspection, Fieldbus and CIM systems. Under these circumstances, it is difficult to expect major positive outcomes from MFEZs and/or IPs. This may explain why some local companies were nervous about foreign competition coming onto their own turf. However, the arrival of TNCs must signal an important opportunity for the manufacturing industry to assert itself while absorbing new technology and expanding its export capacity from raw materials to finished products. The local manufacturing sector must strive towards narrowing the 'technology gap' between the TNCs' technologies and theirs. Related to this gap are the levels of local capabilities needed to acquire and work with the technology (absorptive and sustainable capacity). If, for example, the host country's stock of human capital remains unchanged or relatively low, the technology transfer and other associated FDI contributions will not be realised fully (UNCTAD, 2004).

6.6.2 Innovations, Management Systems and Market Diversification

Trans-National Corporations (TNCs) place greater emphasis on the use of technological innovation, human resource development and cross-functional groups'

decentralisation (World Bank, 2009). Their workforce possesses higher knowledge intensity, more intellectual mastery and abstract skills and more carefully nurtured interdependence. As a result, TNCs have superior marketing and technological capabilities. These capabilities are referred to as the ability of the firm to develop, search for, absorb, and exploit knowledge commercially (Fagerberg et al., 2009). They generally are thought to cover the skill level in the economy, including not only general education but also managerial and technical competences; national research and development efforts and technical personnel working in their fields; and the ability of firms to finance their innovative endeavours.

One of the most important means of generating knowledge in other countries is through the internationalisation of the R&D activities of TNCs. Recent innovation studies suggested that both technology transfer and local R&D capabilities are necessary conditions for technology upgrades in developing countries. Hence, potential spill-overs can only be realised when local firms and regions have the ability and motivation to absorb advanced technology and management know-how (Zhiqiang, 2000). The other main driving force for innovation is market demand, both domestic and foreign. Innovation involves technology push on one hand: That is, the creation of new scientific and technological knowledge. On the other hand, the pull of market demand involves the recognition of the potential for new products and processes. Generally, TNCs are concentrated in industries that exhibit a high ratio of R&D relative to sales and a large share of technical and professional workers. To measure the firm's innovation and market diversification, three sets of variables are used namely: Variables related to patents, new product development, and R&D. Specifically, what is considered is how Foreign Direct Investment (FDI) presence affects the following innovative behaviours of a domestic firm (Galina et al., 2007):

i. Whether the firm owned a patent, how many patent applications the firm filed;
ii. Whether the firm developed a new product;
iii. What percentage of revenue was allocated to R&D expenditure in the firm;
iv. What percentage of employees worked in R&D;
v. The number of scientists and engineers in a firm;

vi. The institutional structure of the firm; and

vii. Added-value services offered to customers such as training of the customer's members of staff and maintenance services.

Nevertheless, the prevalent conditions in the manufacturing sector in general, and in particular the sub-sectors surveyed depicted a weaker and porous conduit through which technology, knowledge and skills could be transmitted from TNCs to local firms. The number of employees in R&D area is negligible, about 0.12% of the total work-force. Non-availability or low number of local engineers and technologists employed in the metal fabrication sub-sector as shown in Figure 5.23 complicated the integration process. The shareholders must be encouraged to invest significantly in R&D activities because of huge returns in the long-term. Alternatively, as a developing economy, Zambian authorities might think of offering the necessary infrastructure and institutions that would facilitate a fruitful interaction of firms with each other and with academia, research centres, Government and other actors in order to take advantage of synergy effects. It has been argued that R&D by foreign affiliates is better than local R&D expenditures, since TNCs have access to the aggregate knowledge base of the parent company and can use the parent firm's R&D facilities. In cases where R&D is performed within host (developing) economies, the expenditures have been found to generate significant efficiency gains, both within and across industries in the R&D performing country (UNCTAD, 1999).

The rationale for this concentration can be found in the need for efficient supervision and scale the economies in the R&D process itself. Also, one major advantage arising from concentration of R&D – from the firm's perspective – is 'agglomeration economics'; meaning it is more efficient to cluster specific R&D expertise in a certain region, using local research institutions and other organisations to form an 'innovation system'. An innovation system is an open network of organisations both interacting with each other and operating within framework conditions that regulate their activities and interactions. The three components of the innovation system namely: networks; innovation activities; and framework conditions, collectively function to produce and diffuse innovations that have, in aggregate, economic, social and/or environmental

value (Edquist, 2008). An innovation system is about people, the knowledge, technology, infrastructure and cultures they have created or learned who they work with, and what new ideas they are experimenting with.

In order to improve efficiency of the local manufacturing sector, certain best practices must be implemented inter alia; teamwork or cross-functional designs, DRP, Benchmarking, TQM systems and flatter structures, Just-In-Time (JIT), Business Process Re-engineering (BPR) and Lean Production among others. However, the general revelation in the study (refer to Figure 5.15) was that unlike TNCs, the local manufacturing sector was characterised by an inability to diversify into new high value-added, dynamic products, through innovations and best practices. As a consequence, many firms especially the MSMEs remain highly dependent on a very narrow range of primary products for export earnings, a reality that leaves them highly susceptible to terms-of-trade shocks. With the exception of innovative capabilities such as teamwork or cross-functional designs, TQM systems and flatter structures which were widely used across the manufacturing sector.

If implemented, both Cellular and Lean Manufacturing would cut down possible cycle times by eliminating waste and increase the value-addition. Nonetheless, lean production requires multi-skilled, flexible and empowered workforce, which happen to be a challenge for the local manufacturing sector currently. The objectives of both Kanban and JIT manufacturing is to avoid the waste associated with over-production, waiting and excess inventory. Whereas BPR is thorough re-thinking of all business processes, whose primary objective is to break away from old ways of working, and effect radical (not incremental) redesign of processes to achieve dramatic improvements in critical areas (such as cost, quality, service and response time) through the in-depth use of information technology, Continual Improvement (Kaizen) seeks 'incremental' improvement over time or 'breakthrough' improvement all at once in light of their efficiency, effectiveness and flexibility.

It is, therefore, incumbent upon the business players to take advantage of the opportunities of either investing in innovative activities or partner with TNCs to imitate

some of their useful practices in order to compete globally. Additionally, there was an urgent need for local industry to begin offering the added-value services as they increased customer confidence and assurance.

6.7 Technical Standards and Quality Certification Schemes

The possession of an International Organisation for Standardisation (ISO) or National certificate or membership in a business association or chamber of commerce both significantly raises the probability of exports prospects. Since none of the respondent firms in all manufacturing sub-sectors surveyed were certified with ZABS (Figure 5.17), the National Standards bureau must seize the opportunity to ensure that locally-owned manufacturing firms are certified in order to enhance competition and widen customer's choice, as attested by 71 percent of the respondents firms in all manufacturing sub-sectors surveyed (refer to Figure 5.19).

6.8 Targeted Market for Finished Products

Figure 5.20 indicates that only 20 percent of respondent firms in Food, Beverages and Tobacco processing sub-sector targeted foreign markets for their finished products, while 83 percent across the sub-sectors sold their products to both foreign and local markets although the actual degrees of penetration in these respective markets could not be ascertained. The low export orientation could be attributed to low value-addition to locally available raw materials, which is not good for a growing economy like Zambia. Zambia actively participates in the 14-country regional SADC Trade Protocol as well as the COMESA with twenty members, offering preferential tariff access to a total market potential of nearly 380 million people. Similarly, Zambia has good quality cotton but textiles production is far less developed than in comparable African states in spite of the privileged access to a large United States market under the Africa Growth Opportunity Act (AGOA) for which Zambia and other countries are eligible. In addition, Zambia is party to the Contonou Agreement, which provides for reciprocal duty free trade provisions between the EU, and certain African and Caribbean nations. The Zambian manufacturing firms must change their focus from local markets to global markets.

Therefore, with quality infrastructure and advanced technologies in the MFEZs and IPs, which increase value-addition and the competitiveness of the goods, domestic firms have the opportunity to diversify into exporting. Taking a snap view of Lafarge Cement; the company has significant linkages to domestic firms. For instance, it is a major client of Zambia Railways Limited and of the largest domestic colliery, Maamba Collieries, which is the biggest job creator in Southern Province. Apart from maintaining 80% share of the domestic market, the company also exports a significant share of its production regionally. Exports are divided fairly evenly between Tanzania (31%), Malawi (21%), Burundi (25%), and the Democratic Republic of Congo (23%). Zambia's principal competitors in this industry are South Africa and Zimbabwe (World Bank, 2009).

6.9 Critical Success Factors (CSF)

Critical success factors (CSF) are defined as "factors which, if addressed, significantly improve project implementation chances" (Mohammad et al., 2010). CSF can also be referred to as 'those characteristics, conditions or variables that, when properly sustained, maintained, or managed, can have a significant impact on the success of a firm competing in a particular industry' (Leidecker et al., 1984). Identification of critical issues and bottlenecks improves projects implementation, and realisation of the firms' objectives becomes easier. Therefore, in order to achieve their goals, investors must direct their resources in critical factors (27.3%) such as new advanced technologies, reduction in the manufacturing costs, improvements in the manufacturing processes, which in turn improves the quality of products (Figure 5.21). Investing in advanced technologies like robotics, automated vision-based inspection systems for operational efficiency, would engender partnership with zone-based TNCs.

However, critical factors like cross-functions and flatter structures, marketing improvements, staff training and pay-for-skills, increasing the market share, added-value services, information and communication technology can only be embarked upon the realisation of the important few factors.

6.10 Human Resource Development

6.10.1 Human Capital Capabilities

Besides technology, TNCs bring into the host country the needed complementary resources such as management experience, entrepreneurial abilities and stock of knowledge, not only by introducing new capital goods and production processes, but also through formal training programmes and learning by doing within foreign affiliates. There is a positive relation between FDI and TFP growth when a host country has achieved a minimum threshold of human capital development. However, most local manufacturing firms did not meet the human capital threshold required for technology and skill spill-overs as could be observed in Figures 5.23 and 5.30.

While FDI inflows have brought new technologies and training practices to Zambia's foreign-owned affiliates, and the economic reforms have introduced a more competitive and open economic climate, local investors in privatised firms and other local MSMEs have, nevertheless, been faced with the significant challenge of having to train and re-skill their workers both in order to grow and compete and to provide TNC affiliates with the quality of products and services they require. The challenge has been particularly severe in one third of the firms in the Fabricated Metals and Products sub-sector where neither local Engineers nor Technologists were employed, worse still the ratio of expatriate Technicians to local ones stood at 3 to 1. There were more expatriate Technicians than local ones which defeated the objective of local labour integration in the value chain. Going by the results of the study, the average employment ratios of the workforce of locals to expatriates in terms of specialisation, across all manufacturing sub-sectors under review were not inspiring.

If business relationships or linkages between TNCs and local companies were improved (an essential condition for sustained transfer of skills and technological capability), sectors such as the Primary Metals/mining sector have potential to become a major supplier outlets for new domestic manufacturing industries and also support other sectors that provide maintenance and basic machinery. Currently, the supporting companies in the case of machinery and equipment, components and spares, are often TNCs who only have a marketing presence in Zambia, importing their products from

abroad. Additionally, the agriculture sector would provide more links with local producers, such as in the cotton and horticulture sub-sectors through the use of out-grower schemes, where cotton and flower supply arrangements would be made with small individual farmers. Therefore, the onus is entirely on the ability of the local textiles, apparel and leather sub-sector to upgrade its investment for value-addition to ginned cotton that is readily available. An opportunity is also presented for the Government to resuscitate textile firms such as Mulungushi Textiles in Kabwe, so that more employment opportunities could be created not only in the agriculture and manufacturing sectors but also in industrial machinery and components sub-sector.

6.10.2 Staff Training, Educational and Professional Qualifications

It is noticeable that in successful cases, the reason that certain countries reaped benefits from SEZs was that host Governments invested heavily in education in order to shift the skills level. SEZs were used as initiators for growth and were also meant to be 'grown out of '. This is obvious in the case of China. Without parallel and substantial investment and improvement in human resource development, the host country can only remain a supplier of cheap labour. This unskilled labour is likely to produce low quality products with little added value (Domician, 2009). Zambia has made big strides in increasing the number of workers who have received professional and vocational training at Certificate, Diploma and Degree levels in view of the fact that the country only had 100 persons with university education and 1,200 with secondary education at the time of independence in 1964 (CSO, 1990 and 2000). However, as indicated in Figures 5.23, 5.24 and 5.25 the results showed that the bulk of the country's workforce possess low qualifications, while critical skills in the professional, technical, administrative, managerial and related occupations were still inadequate to enable the country sustain appreciable development efforts by TNCs, despite staff training and career development programmes being in place in most firms (refer to Figure 5.28). A research carried out by United Nations (2005) found that a lack of sufficiently skilled labour force unable to assimilate and adapt new knowledge to local conditions is an impediment to foster technology transfer.

It is worth noting that while the MFEZs and IPs could trigger growth in Zambian manufacturing sector, the TNCs, the Government and local firms have to realise that investment in human resources is a crucial accompanying step for improving the firm's absorptive capacity and long term sustainability. Cohen and Levinthal (1989) argue that the absorptive capacity depends greatly on prior related knowledge and diversity of background. They assume that a firm's absorptive capacity tend to develop cumulatively and is dependent on the absorptive capacity of its individual members.

6.10.3 Decision-making Structure and Empowerment

The degree of empowerment in decision-making and the type of decision-making structure determine the effectiveness of communication in any organisation. Most TNCs prefer a decentralised decision-making system to the centralised one, in that it distributes decision-making authority throughout a larger group. A decentralised decision-making system connotes a higher authority given to lower level functionaries, executives, and workers, which tend to create less rigidity and flatter hierarchies in organisations. By delegating authority for operating decisions, top management can extend its leadership over a giant enterprise. Thus, there will be more bottom-up directional information flow, allowing for more innovation and efficiency closer to the means of production in what is called TQM. Unfortunately, the opposite was the case in the sub-sectors studied, as Figure 5.27 showed that 76 percent of the respondent firms had centralised systems in place.

Therefore, it was imperative that the local firms re-aligned and empowered their workforce in decision-making to the dictates of TNCs, in order to quicken and promote autonomy, initiative and creativity on the part of subordinates. As the success and survival of the organisation does not depend entirely upon a few individuals at the top, decentralisation makes for stability and continuity of the enterprise. Furthermore, in order to improve absorptive capacity, the organisational structure should be flat, flexible, adaptable, dynamic, and participative (Daghfous, 2004).

6.10.4 Suitability of Skills to Production Technologies and Labour Turnover

If current skills were suitable for current low levels of technologies as shown in Figure 5.30, then a challenge for the local manufacturing sector would be to look for qualified manpower with technical *know-how* to manage new technologies to be brought by TNCs in MFEZs and IPs, otherwise, there would be need for increased closer supervision and re-training of the workers. Alternatively, TNCs/FDIs may be encouraged to import skilled management and technical personnel or they may train local workforce and develop skills in-house. The results shown in Figure 5.22 about the annual labour turnover standing at less than 10%, poses an opportunity for internalisation and specialisation of skills, as well as human capital accumulation.

6.11 Policy Challenges in the Implementation of the MFEZs/IPs

As earlier noted, clearly defined investment policies must be formulated, which have the economic or social objectives of what qualifies to be a development oriented - investment policy. For instance, if the tax holiday expired what would happen to the TNCs in the Zone? Similarly, a highly efficient and strong TNC, in the absence of an appropriate competition policy framework might lead to a fall in the number of local firms as the less efficient local firms are forced out of business (crowding out) and increase local unemployment levels (WTO, 1998).

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The overall objective of the research was to assess the readiness of the local manufacturing firms to be integrated into the MFEZs production networks. This chapter therefore, presents conclusions and recommendations, and also discusses the limitations of the study and possible areas of further research on the MFEZs and IPs in Zambia.

7.2 Conclusions

This section provides conclusions based on foregoing study. The following conclusions were made:

1) Constant power outages or insufficient power impacted negatively on the economy as industrial operations and processes were disrupted. Consequently, this affected the actual plant or capacity utilisation in most manufacturing sub-sectors. However, the establishment of the MFEZs and IPs is poised to address the power deficit, through improvement of power generation and distribution to the zones and parks by ZESCO in collaboration with Government and industrial players.

2) Failure by the Zambian manufacturing sector to produce secondary inputs, spare parts, components and tools, and other specialised raw materials like polypropylene has forced most local manufacturing firms to import them from Republic of South Africa, Tanzania, China, India and the Middle East.

3) Awareness on the establishment of the MFEZs and IPs in Zambia was relatively moderate among most of the CEOs and other firms' representatives. This was mainly because the Government agency (ZDA), whose mandate was to further economic development through promotion of investment and exports, employed an ineffective media (electronic and print) to disseminate the information to potential investors. Furthermore, there was no proper coordination among the various investment promotion agencies such as the Investment Centre at ZDA, Registrar of Companies (PACRA), and Immigration Department, agencies dealing with land, power (energy), environmental protection (ZEMA) and sector regulators. However, with scant knowledge and little understanding about the MFEZs and IPs, most of the respondent CEOs preferred the Chambishi MFEZ and Lusaka East/Sub Zone due to their proximity to the source of raw materials (metals) and logistic challenges, respectively.

4) Employing critical factors which assisted in achieving business strategies and objectives would make the local manufacturing firms have a competitive edge over other market players. It was established from the survey conducted that although such factors as investments in advanced technologies, reduction in the manufacturing costs, improvements in the manufacturing processes and existing products, and development of new products were considered as the most popular and important critical factors, most respondent firms appeared not to take keen interest in applying any of them.

5) Due to the wider technological gap between local manufacturing firms and TNCs, especially in the Engineering-related, Plastics, Rubber and Chemicals sub-sectors, absorptive and sustainable capacity both in terms of technology and skills of the manufacturing sector was relatively low. The manufacturing sector was characterised by outdated technology with limitations, for instance robotics, FMS, Lean Production, automated storage and retrieval, and inspection systems, Fieldbus, modelling and simulation, and CIM systems were not installed, with the exception of PLC, Automated Part Identification (bar-coding), CAD, CAE and CAM systems.

6) In the same vein, most local manufacturing firms did not meet the minimum human capital threshold suitable for technology and skills transfer, such as management experience and entrepreneurial abilities. In addition, the average employment ratios of the workforce of locals to expatriates in terms of specialisation especially engineers, technicians and technologists, were too low to not only stimulate meaningful labour integration, but also animate internalisation and specialisation of skills. It was also noted that there was little government support and lack of clearly defined policy guidelines toward the local resource appreciation, for instance, there were no labour laws that would compel TNCs to employ more local workforce for every expatriate. The share of local investors was very low, which could negatively affect the perception of the local population. Without the involvement of local partners, it is hard to anticipate the occurrence of "spill-over effects".

7) It is common knowledge that domestic productivity growth is mainly related to foreign innovation, rather than domestic innovation, and that the spillovers from TNCs have a positive effect on productivity growth, especially in industries with high degrees of competition or high innovations. The competitiveness of the local manufacturing sector was dependant upon the implementation of such best practices as teamwork or cross-functional designs, DRP, Benchmarking, TQM systems and flatter structures, JIT, BPR and Lean Production, among others. None the less, one evident feature was that Lean Production, SPC and BPR were not employed in any of manufacturing sub-sectors surveyed, except in the Chemical and Allied Products sub-sector, while the widely used innovative systems were cross-functional designs, TQM systems and flatter structures.

8) In order to enhance integration of local manufacturing industry into global value-chain, it was imperative to emphasise much on the quality certification schemes and market diversification through in-house designing (R&D), and strengthen links between the manufacturing firms and the institutions of learning and research centres. However, none of the firms had introduced any new product on the market in the last 2 years and the percentage of employees under R&D sections left much

to be desired. Subsequently, the local manufacturing sub-sectors' export profile was not good, as only 20 percent of firms in food, beverages and tobacco processing sub-sector exported their finished goods. The export destinations included Congo (DR), East Africa, Malawi and Asia for non-traditional products such as food items, cement, industrial boilers and chemicals, burley tobacco and cotton lint, among others.

7.3 Recommendations

In the context of the afore-mentioned conclusions, the recommendations require a two - pronged approach from both the manufacturing sector and the Government.

7.3.1 The Manufacturing Industry Prong

1) To attain the business strategy and compete globally, the local manufacturing firms must endeavour to invest their resources in the following critical factors:

    i. Advanced Manufacturing Technologies and Innovations;

    Investment in advanced manufacturing technologies and innovations on one side increases absorptive capacity of a business entity, and on the other side improves local labour capabilities in terms of skills. However, the investment could only be attainable if the Government incentivised or removed import duties and other corporate taxes on productive assets, as this would facilitate importation of such advanced technologies as:

    a) CAD, CAE and CAM for modelling and simulation in designing and engineering operations;
    b) Robotics with or without sensing devises and automated vision-based inspection systems;
    c) FMS, PLC controlled machinery, Automated Part Identification systems such as Bar-coding, Automated Storage and Retrieval systems, material-handling and inspection systems which are applied in processing and assembly operations; and

d) Fieldbus system among others, which uses digital-remotes to control the obnoxious production processes.

Alternatively, TNCs must be encouraged to partner with local enterprises through various linkages such as joint ventures or strategic alliances in order to build capacity in the long run.

i. Reduction in the manufacturing costs;
ii. Improvements in the manufacturing processes and existing products through market diversification and repositioning; and
iii. Development of new products by investing into in-house designing (R&D).

2) In order to improve efficiency and productivity in the manufacturing sector as a whole, the industrial players must endeavour to be innovative through the use of information and communication technologies like JIT, BPR, SPC, Benchmarking, Group technology and Lean Production among others coupled with cross-functional groups' and decentralised structures which tend to reduce the management layers, but increases communication.

3) They must also embark on providing added-value services to the respective customers. Besides the relative and absolute technological capabilities, there is need for a successful interaction of firms with each other and with academia, government and other stakeholders, in order to take advantage of synergy effects across the manufacturing sub-sectors.

4) The prospects of manufacturing exports would only be improved if the firms certified with either an ISO or National Standards or the membership in a business association. Therefore, the National Standards body (ZABS) must seize the opportunity to market itself. The ZABS must strengthen its collaboration with other stakeholders in sensitising all business enterprises on the globally acceptable standards involved in procurement, processing, packaging and promotions. It must also enforce this statutory requirement and make quality certification compulsory.

7.3.2 The Zambian Government Prong

7.3.2.1 Building a Strong and Dynamic Manufacturing Sector

i. A weak domestic private sector significantly suffocates potential beneficiation from TNCs through linkages and spillover effects. Therefore, the Government must develop a stronger and dynamic domestic enterprise sector that is likely to attract additional FDI as it demonstrates a conducive economic climate for foreign investment. However, the domestic manufacturing sector in Zambia is still at an infancy stage of development. Despite recent changes in policy-orientation that favour private sector participation and development, local manufacturing investors still perceive the current policy environment as unfriendly. For instance, lower interest rates are a basic pre-condition to domestic enterprise development, however, it should be well known, that falling interest rates do not automatically lead to greater availability of credit to local investors.

   To this effect, the Government should introduce linkage promotion programmes to identify and upgrade local enterprises that have the potential to add value to the locally available resources and either export or supply to TNCs within the local market. Such linkages programmes have been successful in a number of emerging economies, such as Singapore and Ireland through the Singapore Local Industry Upgrading Programme (SLIUP) and the National Linkage Programme (NLP) (Sánchez et al., 2009). Created in 1986, and financed and mediated by Economic Development Board (EDB), SLIUP's objective seeks to build partnerships between specific TNCs and possible local enterprises/suppliers. TNCs are encouraged to choose local sub-contractors and suppliers and assist them in improving overall operation efficiency and in acquiring new technological knowledge. An engineer from the TNCs is chosen and begins working with the selected local enterprise to make it more competitive globally. During this stage, the EDB pays the engineer's salary. In the case of Ireland, the NLP was born in 1985. In later stages this programme also encouraged successful firms to become global manufacturers/suppliers.

In Ireland the need to promote linkages between TNCs and domestic firms became evident by the early 1980s. In 1985 the NLP similar to Singapore's LIUP was created. The organisation identified opportunities for linkages with TNCs, built a census of domestic firms that could be potential suppliers and began working with some companies to increase its marketing, management and production capabilities. The programme started with 60 domestic firms, which benefited from assistance in areas like quality standards, financial management and logistics. TNCs provided *know-how* in the process, and the programme resulted in the creation of some linkages and the expansion of the domestic value added generated by TNCs. In addition, incentives to TNCs or foreign enterprises that give business to local suppliers should also be part of such programmes.

ii. FDI is not homogeneous and its benefits vary across sectors and countries. If policy-makers focus on trying to attract FDI to an economy with an environment that is unfavourable to domestic investment and private enterprise, the results are likely to be less favourable with respect to the long-term development needs of a country. The enabling framework for FDI must involve strengthening of the financial sector by improving the macroeconomic climate, as it impacts positively on any investment, especially export-oriented. Any chronic weakness complicates business operations particularly for those enterprises producing for the local market and requiring imported inputs. Therefore, the Government must encourage value addition of primary commodities, especially in agricultural and mining sectors through enacting industrialisation and trade policies that promote increased linkages among various sectors of the economy. An investment policy should have a clear focus on technology up-gradation and transfer, human resource development and job creation.

7.3.2.2 Infrastructure Development (Transport, Telecommunication and Energy)

i. Infrastructure services such as telecommunications, water, electricity and transport are strategically vital for any diversification strategy. They are important determinants of future investment and growth of the manufacturing sector. In order to improve the conditions for private investment and strengthen export potential, the Government should give priority to removing the present bottleneck in cargo transport. Reducing airport landing fees should be seriously considered. Expansion of telecommunication system, and construction and improvement of the rural road network will help exploit investment opportunities, including the development of the manufacturing firms in relatively isolated areas (rural) which may be operating outside the MFEZs' and IPs' provisions.

ii. The availability, cost and reliability of energy are among the main constraints to potential and existing investment in the country. Energy is critical for any investor particularly those engaged in energy-intensive manufacturing. The main policy objective towards infrastructure services should be to create efficient and well-managed enterprises that provide high-quality services to the manufacturing sector at competitive rates. It is, therefore, imperative that the Zambian Government in conjunction with ZESCO upgraded and developed infrastructure, by building more power-generation points (hydro, bio, solar or thermal) throughout the country, especially in areas where water basins and falls are available. Alternatively, ZESCO should venture into Public-Private Partnerships with other investors or at least float its shares on the local and/or the international stock exchange markets. The power utility firm must also review the pricing and method of distribution of power to the business sector with a view to eliminating distortions and disruptions which hamper new and potential investments.

iii. The Government must establish think-tanks in respective industries, which are going to identify specific sectors and activities of investments to encourage production and entrepreneurship (capacity building) among native people. The

think-tanks must also carry out an impact assessment on the locally-owned firms including those firms which are located outside the provisions of the MFEZ/IP.

Alternatively, the Government must establish Business Incubators (BIs) in each province for strategic industries connected to native natural resources beneficiation. A business incubator refers to an economic development tool designed to accelerate growth and success of entrepreneurial companies through an array of business support resources and services. It is usually a property with small work units which provides a supportive environment to entrepreneurs at start-up and during the early stages of businesses. Incubators provide an entrepreneurial and learning environment, ready access to mentors and investors and visibility in the marketplace. In the Incubators, entrepreneurs would have unlimited access to business development services and inputs such as entrepreneurship training, information, finance, quality control, networking, and business counseling, among others. A BI's main goal is to produce successful firms that will graduate to financial viability and independence.

iv. From the survey conducted, it was generally highlighted that the manufacturing sub-sectors made their zonal preferences based upon the zone which offered the best economies of scales in terms of logistics or proximity to the sources of inputs, for example, the metal fabrication sub-sector opted to re-locate into the Chambishi MFEZ (raw materials of copper and other minerals). To this effect the Government must come up with a clear vision for each MFEZ/IP such as grouping industries together (industrial clustering). For instance, the Government through ZDA must set up a textile zone in Chipata district of Eastern Province specifically for cotton and tobacco beneficiation industries. This formulation must also involve the direct participation of the private sector to drive its own growth, with the Government providing policy direction.

7.3.2.3 Human Capital Capabilities

i. The Government must offer additional incentives to both local and foreign investors that encourage in-house technical training and skills development. For instance, incentives such as double-deductions for human resource development, which enables any investor in MFEZs/IPs to claim twice the sum of its training budget as a taxable expense, would be appropriate for the Government to implement. These efforts should be strengthened as various skills currently are still lacking. Otherwise, TNCs will to have to resort to importing skills, in particular management and specialised technical skills.

ii. Any investor certainly looks at not only labour cost but also labour productivity and the availability of skilled labour as variables for determining an investment destination. The Government must, therefore, restructure the educational and training programmes with a view to creating a national system that meet the requirements of an industry. It should also seriously encourage provision of quality professional education and skill training beyond what is currently done. In order to accelerate assimilation of advanced technologies and appreciation of skills, the Zambian Government must put in place an enforceable policy that would compel TNCs operating in the MFEZs and IPs to exchange or transfer technology to local workforce and limit the number of expatriates, preferably 1 expatriate to 10 locals. However, this must be complimented by the minimum human capital thresh-hold which could be obtained from restructured and improved institutions of learning.

7.3.3 MFEZ/IP Challenges and Investment Promotions

1) The possible challenges in implementing MFEZs and IPs include constraint on public funding for development, revenue leakages, administrative challenges and allocation of land to speculators/investors. Therefore, mitigatory measures must include:

i. Fencing the zones, zoning and clear documentation to enable accountability of goods produced in the zones for pricing purposes;
ii. With regard to revenue leakage, customs authorities should develop regulations to govern the movement of goods produced within the zones as well as punitive measures for offenders; and
iii. To minimise speculation, land must only be allocated after careful analysis of the projects to be implemented.

2) Any investment promotional activity is very useful in attracting foreign and domestic investment into an economy. Unlike what is currently obtaining, where the MFEZ Department at ZDA operates like an enquiry desk waiting for would-be-investors to knock on its door, the Zambian Government must set up a highly autonomous MFEZ/IP Authority with a powerful Board of relevant stakeholders, with a wide range of powers to take decisions with respect to licensing and facilitation (work permits, customs) of new businesses. The eventual establishment of this MFEZ/IP Authority would strengthen coherence in investment promotion, as it would be expected:

i. To develop a charter that stipulates specific functions of the Authority;
ii. To introduce the tracking system for investors that will serve as a planning, monitoring and evaluation mechanism for rendering support to new and existing investment in the zones and parks. This tracking mechanism will assist the MFEZ/IP Authority to keep track of each enterprise in the zone or park, in order to know when the amnesty period (tax holiday) elapses for incentives to cease, in addition to enterprises intending to *relocate* to other countries after the amnesty period, and thereby denying the country the opportunity to tap the full potential benefits from the enterprises. This can be addressed by special flagging in the computer system against such enterprises. The MFEZ/IP Authority must also undertake in-depth analysis of direct investment flows into priority manufacturing sub-sectors;
iii. To increase awareness of the MFEZs/IPs concept through policy advocacy that involves other private sector players. The promotion must be targeted at

potential investors, through local seminars, press tours, media relations and participation in specific national and international economic symposiums. Other means of communication must include face-to-face meeting with CEOs and subsector's associations, telemarketing and direct mail;

iv. To provide support through improvement of the operating environment (both internal and external) by identifying policy and infrastructure bottlenecks.

Consequently, in order to reduce the bureaucracy and the cost of doing business through uncoordinated and sometimes counter-productive activities, the Zambian Government must consider setting up a one-stop investment centre to accommodate all stakeholders such as the Investment Centre (ZDA), the PACRA, the Immigration Department, the agencies dealing with land, ZESCO, ZEMA and the sector regulators in this respect. Additionally, the success of MFEZs/IPs in Zambia is dependant entirely on the centralisation of the institutional framework by the Government, which allows for a long-term view, strong co-ordination between the Central and the Local (provincial) Governments.

7.4 Study Limitations and Recommendations for Further Studies on MFEZs/IPs

The main focus of study was to identify the opportunities and challenges anticipated in the manufacturing sector, in the wake of the proposed multi-facility economic zones in Zambia. It looked at the manufacturing sector's capabilities to be integrated into MFEZ value chains. At the time of conducting the current study, most of zones and parks were under construction while others were still on paper, except Chambishi MFEZ which was in its infancy stage (refer to Appendix 4). Like every research, my findings must be interpreted cautiously given the relatively small sample size, the nature and the size of firms that were used. The sample size was limited in scope due to problems of quality data and availability of funds.

It would, therefore, be interesting to undertake a comprehensive study that takes into account the narrowness of the scope to specific zones and parks. Given the geographic and sub-sector disparity of the sample used in this study, it is suggested that a large,

well-funded research be undertaken with a specific thrust on the evaluation of the progress made in the establishment of the MFEZs and IPs. The future studies would look at the development status, challenges and opportunities emanating from each zone or park, the type and depth of technology employed in each zone, as well as the level of technology and skills absorption and transfer. Such findings are likely to enrich the understanding of this fascinating area.

The results obtained in further studies may be different depending on the sample size, source and type of the data. For example, information about sales revenue and operational costs, if collected would have helped in determining value-addition per employee (a measure of productivity). It is also recommended that should the funds be available, areas such as Northern, Luapula, Eastern and Central Provinces must be included in the sample.

REFERENCES

1) Adler, J.H., (1965), *Absorptive Capacity: The Concept and its Determinants.* Brookings Institution. Washington, DC.

2) Aggarwal, A., (2004), *Export Processing Zones in India: Analysis of the Export Performance.* Indian Council for Research on International Economic Relations (ICRIER) Working Paper No. 148.

3) Agndal, H. and S. Chetty, (2007), *The Impact of Relationships on Changes in Internationalisation Strategies of SMEs.* European Journal of Marketing, 41 (11-12), 1449-1474.

4) Alcaraz, J.L, A.A. Iniesta and M.C.J. Castelló, (2012), Benefits of advanced manufacturing technologies. African Journal of Business Management Vol. 6(16), pp. 5524-5532, 25 April. Available online at http://www.academicjournals.org/AJBM DOI: 10.5897/AJBM11.2777. ISSN 1993-8233 ©2012 Academic Journals.

5) Andersson. T., S. Schwagg Serger, J. Sörvik and E.W. Hansson, (2004). *The Cluster Policies Whitebook.* Malmo, Sweden: International Organization for Knowledge Economy and Enterprise Development.

6) Baissac, C., (2003), *Maximising the Developmental Impact of EPZs: A Comparative Perspective in the AFRICAN Context of Needed Accelerated Growth.* Presentation at the Johannesburg EPZ Symposium, Oct 15-16.

7) Baissac, C., (2010), *Planned Obsolescence: Export Processing Zones and Structural Reform in Mauritius.* Mimeo, World Bank. September.

8) Beamish, P. W.M (1990), *The Internationalization Process For Smaller Ontario Firms: A Research Agenda.* Research in Global Business Management, 1, 77-92.

9) Belassa, B., (1978), *Exports and Economic Growth*. Journal of Development Economics 5 (1): 181-189.

10) Blanco de Armas Enrique and Sadni-Jallab Mustapha, (2002), *A Review of the Role and Impact of Export Processing Zones in World Trade: The Case of Mexico.* GATE Working Paper No. 02-07, Groupe d'Analyse et de Theorie Economique, Universite de Lyon, France.

11) Böhmer, A and N. Farid, (2010), *Designing Economic Zones for Effective Investment Promotion* Working Group 1: Investment Policies and Promotion 15-16 February 2010, Amman OECD.

12) Borensztein, E., J. De Gregorio and J-W. Lee, (1998), *"How does Foreign Direct Investment affect Economic Growth?"* Journal of International Economics, vol. 45(1), pp.115-135.

13) Bornstein, L., (2003), *Management Standards and Development Practice in the South African Aid Chain.* Public Administration and Development, 23(5), 393-404. doi: 10.1002/pad.291.

14) Brautigam, D., (1997), *Substituting for the State: Institutions and Industrialization in Eastern Nigeria.* World Development 25, 7: 1063–80.

15) Brautigam Deborah, (2009), *The Dragon's Gift: The Real Story of China in Africa.* Oxford: Oxford University Press.

16) Brautigam Deborah, Farole Thomas, and Tang Xiaoyang, (2010), *China's Investment in African Special Economic Zones: Prospects, Challenges, and Opportunities*. March 1, 2010, Number 5. www.worldbank.org/economicpremise.

17) Brautigam Deborah and Tang Xiaoyang, (2011), *African Shenzhen: China's special economic zones in Africa, Journal of Modern African Studies*, Cambridge University Press 49, 1 (2011), pp. 27–54. Washington DC, USA.

18) Brautigam Deborah and Tang Xiaoyang, (2013), *Going Global in Groups: Structural Transformation and China's Special Economic Zones Overseas.* World Development.

19) Bruin, de E.G.A.J and M.J. Tambatamba, (1995), *Technology-based Development Strategy for the Agricultural Machinery Sub-sector*: Zambia as a Case Study, Ph.D. Thesis, University of Technology, Eindhoven, 1995.

20) Callanan, B., (2000), *Ireland's Shannon Story: A Case Study of Local and Regional Development*. Dublin: Irish Academic Press.

21) Castro, J., L.R. Spila, I. Andoni, I. Pradales, N. Pérez Vega and C.M. Castro, (2010), *Absorptive Capacity, Innovation Networks and Products: SME in the Basque Country.* International Journal. Innovation and Regional Development, Vol. 2, No. 3.

22) Central Statistics Office (CSO), (2008), *National Accounts and Input-Output Tables*. Government Printer, Lusaka.

23) Central Statistical Office (CSO), (2010), *National Accounts Statistical Bulletin*, Government Printer, Lusaka.

24) Central Statistics Office (CSO), (2011), *National Accounts Statistical Bulletin*, Government Printer, Lusaka.

25) Centre for Development and Enterprise, (2012), *Special Economic Zones: Lessons for South Africa from International Evidence and Local Experience.* CDE Round Table Number 19, June 2012. CDE, Johannesburg, South Africa.

26) Cheesman Andrew, (2012), *Special Economic Zones and Development: Geography and Linkages in the Indian EOU Scheme:* Bartlett DPU Working Paper No. 145, July, University College London. ISSN 1474-3280.

27) Chinguno, C., (2009), "*Neither Fish nor Flesh: A Review of South Africa's Version of the Export Processing Zones."* University of the Witwatersrand, Sociology, Work and Development Institute, Report for the ILO. Johannesburg.

28) Chinguno, C., (2011), *Informing South African Policy, South Africa's Experience with Special Economic Zones. Report Commissioned by CDE,* November.

29) Cling, J.P. and G. Letilly, (2001), *Export Processing Zones: A Threatened Instrument for Global Economy Insertion?*, DIAL/Unite de Recherche CIPRE Document de Travail DT/2001/17, available at: http://www.dial.prd.fr/dial_publications/PDF/Doc_travail/2001-17.pdf.

30) Cohen, W.M. and D.A. Levinthal, (1989), *Innovation and Learning: The two faces of R&D.* Economic Journal 99 (397), 569-596. http://dx.doi.org/10.2307/2233763

31) Cohen, W.M. and D.A. Levinthal, (1990), *Absorptive Capacity: A New Perspective on Learning and Innovation.* Administrative Science Quarterly. Vol. 35 p. 128-152.

32) Collier, P. and J. Page, (2009), *Industrial Development Report 2009.* Vienna: UNIDO.

33) Colombo, M. G., M. Delmastroand and L. Rabbiosi, (2007). *"High Performance" Work Practices, Decentralization, and Profitability: Evidence from Panel Data.* Industrial and Corporate Change, 16(6): 1037-1067.

34) Daghfous, A., (2004), *An Empirical Investigation of The Roles of Prior Knowledge and Learning Activities in Technology Transfer*. Technovation. Vol. 24 p. 939-953.

35) Davenport, T.H. and L. Prusak. (2000), *Working Knowledge: How Organisations Manage What They Know*. Boston, MA: Harvard Business School Press.

36) Davies, M., (2010), *How China is Influencing Africa's Development.* OECD Development Centre.

37) Department of Trade and Industry (DTI), (2008), *Industrial Development Zone Programme Guidelines*, September. South Africa.

38) DTI, (2011), *Draft Policy Statement on Industrial Development Zones.* South Africa.

39) DTI, (2012), *Policy on the Development of Special Economic Zones in South Africa.* Government Gazette, January, 23. No.34968 General Notices Notice 45. Pretoria, South Africa.

40) DHL, (2013), *Internationalisation – A Driver for Business Performance.* January.

41) Doole, I., T. Grimes and S. Demack, (2006), *An exploration of the management practices and process most closely associated with levels of export capability in SME., Marketing Intelligence and Planning*, 24 (6), 632-647.

42) Driver, A., (1998), *The Fish River SDI: New Hope for Industrial Regeneration in the Eastern Cape.* Development Southern Africa, 15(5):787-808.

43) Dyer, J. H. and H. Singh, (1998), *The Relational View: Cooperative Strategy and Sources of Inter-organisational Competitive Advantage.* Academy of Management Review, 23, 660-679.

44) Enright, M.J., E. Scott and K. Chung, (2005), *Regional Powerhouse: The Greater Pearl River Delta and the Rise of China, Singapore:* John Wiley and Sons (Asia).

45) Ernst. D and L. Kim, (2002), *Global Production Networks, Knowledge Diffusion, and Local Capability Fomation.* Research Policy 31, 1417-1429, Elsevier, February.

46) Fagerberg, J., M. Srholec and B. Verspagen, (2009), *Innovation and Economic Development*. Working Paper 32, United Nation University–MERIT, Maastricht**.**

47) Falvey, R., N.Foster and D. Greenaway, (2007), *Relative Backwardness, Absorptive Capacity and Knowledge Spill-overs.* Economics Letters, *97*, 230–234.

48) Farole Thomas, (2010), *Second Best? Investment Climate and Performance in Africa's Special Economic Zones.* The World Bank Policy Research, Working Paper, P4.

49) Farole Thomas, (2011), *Special Economic Zones in Africa: Comparing Performance and Learning from Global Experiences.* The International Bank for Reconstruction and Development/World Bank, Washington DC, USA. Available at https://openknowledge.worldbank.org/handle/10986/2268.

50) Farole Thomas and Akinci Gokhan, (2011), *Special Economic Zones Progress, Emerging Challenges, and Future Directions.* International Trade Department Investment Climate Department, World Bank.

51) Farroll, T., (2011), *Special Economic Zones in Africa: Comparing Performance and Learning from Global Experience.* World Bank, Washington, DC.

52) Ferguson, P.R., and G.J.. Ferguson, (2009), *Industrial Economics; Issues and Perspectives.* Macmillan Press Ltd, London, United Kingdom.

53) Ferrie Joseph P., (1999), *Yankeys Now: Immigrants in the Antebellum U.S.A, 1840-60.* New York: Oxford University Press.

54) Foreign Investment Advisory Service (FIAS), (2008), *Special Economic Zones: Performance, Lessons Learned, and Implications for Zone Development.* Working Paper 45869, World Bank, Washington, DC. USA.

55) Fourcade, C., (2002), Le *Territoire Comme Atout des Processus D'internationalisation des PME: Le Concept de Milieu Internationalisant, In* Actes Du Xxviii^{ème} Colloque de L'asrdlf. Trois-Rivières, Québec.

56) Froyen, R.T., (2009), *Macroeconomics: Theories and Policies.* (9e). Upper Saddle River, New Jersey: Prentice Hall.

57) Fu, X., A., Cosh, Q. Yang and A. Hughes, (2006), *World Innovation Frontier and the EUUS Innovation Gap.* Paper presented at the 9th North America Workshop of Efficiency and Productivity Analysis, Stern Business School, New York University, N. Y, 2006.

58) Fu, X., (2007), *'Trade-Cum-FDI, Human Capital Inequality And the Dual Economy in China: The Signer Perspective',* Journal of Economic Change and Restructuring, forthcoming.

59) Gabriel Omoh, (2012), *Lekki Free Trade Zone Attracts N170bn Investment".* Vanguard, August 6.

60) Ge Wei, (1999), *Special Economic Zones and the Opening of the Chinese Economy: Some Lessons for Economic Liberalization.* World Development 27 (7): 1267–85.

61) Gemser, G., M. J. Brand, A. Sorge, (2004), *Exploring the Internationalisation Process of Small Businesses: A Study of Dutch Old and New Economy Firms*. Management International Review, 44 (2), 127-150.

62) Griffith, R., S. Redding and J. Van Reenen, (2003*), "R&D and Absorptive Capacity: Theory and Empirical Evidence."* Scandinavian Journal of Economics, vol. 105(1), pp. 99-118.

63) Government of the Republic of Zambia (GRZ), (1965), *First National Development Plan (FNDP[1]): 1966 - 1970*. Government Printer, Lusaka. Zambia.

64) GRZ, (1971), *Second National Development Plan (SNDP[2]): (1972 - 1976).* Government Printer, Lusaka.

65) GRZ, (1977), *Economic Reports, NCDP*. Government Printer, Lusaka, Zambia.

66) GRZ, (1979), *Third National Development Plan (TNDP[3]): 1979 - 1983*. Government Printer, Lusaka.

67) GRZ, (1989), *Fourth National Development Plan (FNDP[4]): 1989 - 1993.* Government Printer, Lusaka.

68) GRZ, (2006), *Fifth National Development Plan (FNDP[5]): 2006 - 2010*. Government Printer, Lusaka.

69) GRZ, (2011), *Sixth National Development Plan (FNDP[6]): 2011 - 2015.* Government Printer, Lusaka.

70) GRZ, Vision 2030, (2006), *A Prosperous Middle Income Nation by 2030.* Ministry of Finance and National Planning. Lusaka, Zambia. Available at www.mcti.gov.zm/index.php/component/docman/doc.../12-zambia-vision-2030.

71) Graham, E., (2004), *Do Export Processing Zones Attract FDI and its Benefits? The Experience from China*. International Economics and Economic Policy 1: 87–103.

72) Gulhati, R. and U. Sekhar, (1982), *Industrial Strategy for Late Starters: The Experiences of Kenya, Tanzania and Zambia*. World Bank Staff Working Paper No. 457, Washington. DC.

73) Hamweendo Agripa, (2006), *Cellular Manufacturing of Selected Copper Products in Zambia.* M. Eng. Dissertation. University of Zambia, Lusaka.

74) Harrison, N., and D. Samson (2002). *Technology Management – Text and International Cases.* McGraw-Hill Higher Education.

75) Hirschman, A.O., (1958), *The Strategy of Economic Development.* New Haven: Yale University Press.

76) Hoffman, K. and N. Girvan, (1990), *Managing International Technology Transfer. A Strategic Approach for Developing Countries.* IDRC.

77) Hutchinson, K., N. Alexander and B. Quinn, (2005), *The Internationalisation of Small to Medium-Sized Retail Firms: Towards A Conceptual Framework.* Journal of Marketing Management, 21, 149-179.

78) Hutchinson, K., N. Alexander and B. Quinn, (2006), *The Role of Management Characteristics in the Internationalisation of SMEs, Evidence from the UK Retail.* Journal of Small Business and Enterprise Development, 13 (4), 513-534.

79) Hwedi Osei, (1987), *The State and Development in Southern Africa: A Comparative Analysis of Botswana and Mauritius with Angola, Malawi and Zambia*. African Studies Quarterly Report, World Bank, Washington. D.C. USA.

80) Jain, R.K. and H.C. Triandis, (1990), *Management of Research and Development Organisations- Managing the Unmanageable.* New York: Wiley.

81) Jayanthakumaran Kankesu, (2003), *Benefit-Cost Appraisals of Export Processing Zones*: A Survey of the Literature. Development Policy Review Vol. 21 (1): p 62–64.

82) Jenkins, M., O. Esquivel, and B. Felipe Larrain, (1998), *Export Processing Zones in Central America*. Development Discussion Paper No. 646, Harvard Institute for International Development. Cambridge, MA: Harvard University.

83) Johansson, H., (1994), *The Economics of Export Processing Zones Revisited.* Development Policy Review 12(4): 387–402.

84) Johansson, H. and L. Nilsson, (1997), *Export Processing Zones as Catalysts.* World Development 25 (12): 2115–28.

85) Johanson, J. and J. E. Vahlne, (1977), *The Internationalization Process of the Firm: A Model Knowledge Development and Increasing Foreign Market Commitments.* Journal of International Business Studies, 8 (1), 23-32.

86) Julien Pierre-André, (1997), *Les PME: Bilan et Perspectives*. GREPME, Economica, Paris.

87) Kato, T., and M. Morishima, (2002), *The Productivity Effects of Participatory Employment Practices: Evidence from New Japanese Panel Data*. Industrial Relations 41, 41(4): 487-520.

88) Kim, L. (1997), *Imitation to innovation: The dynamics of Korea's Technological Learning*. Harvard Business School Press, Harvard.

89) Koc, T., (2007), *Organisational Determinants of Innovation Capacity in Software Companies.* Computers and Industrial Engineering, 53, (3): 373-385.

90) Koch, A., and H. Strotmann, (2008), *Absorptive Capacity and Innovation in the Knowledge Intensive Business Service Sector*. Economics of Innovation and New Technology, *17*,511-531. http://dx.doi.org/10.1080/10438590701222987

91) Knoth, C., (2000), *Special Economic Zones and Economic Transformation: The Case of China.* Doctoral dissertation, University of Konstanz.

92) Kostopoulos, K., A. Papalexandris, M. Papachroni, and G. Ioannou, (2011), Absorptive Capacity, Innovation, and Financial Performance. Journal of Business Research, 64, 1335-1343. http://dx.doi.org/10.1016/j.jbusres.2010.12.005.

93) Kusago, T. and Z. Tzannatos, (1998), *Export Processing Zones: A Review in Need of Update.* SP Discussion Paper 9802. World Bank, Washington, DC.

94) Laghzaoui Soulaimane, (2006), *L'internationalisation des PME: Pour Une Relecture en Termes se Ressources et Compétences*, In Actes du 8ème CIFEPME, Suisse.

95) Laghzaoui Soulaimane, (2011), *SMEs' Internationalisation: An Analysis with the Concept of Resources and Competencies*. Journal of Innovation Economics and Management 1/2011 (n°7), p. 181-196. URL: www.cairn.info/revue-journal-of-innovation-economics-2011-1-page-181.htm. English abstract on Cairn International Edition

96) Lall, S., (1995), *Industrial Strategy and Policies on Foreign Direct Investment in East Asia.* Transnational Corporations. 4, 3: 1–26.

97) Lane, P. and M. Lubatkin, (1998), *Relative Absorptive Capacity and Inter-organisational Learning.* Strategic Management Journal, Vol. 19, No. 5, pp.461–477.

98) Lane, P.J, B., Koka and S. Pathak, (2006), *The Reification of Absorptive Capacity: A Critical Review and Rejuvenation of the Construct,* Academy of Management Review, No. 31, Vol. 4, pp. 833–863.

99) Laursen, K., and N. Foss, (2003), *New Human Resource Management Practices, Complementarities and the Impact on Innovation Performance.* Cambridge Journal of Economics, 27(2): 243-263.

100) Lepak, D., and S. Snell, (1999), *The Human Resource Architecture: Toward a Theory of Human Capital Allocation and Development.* Academy of Management Review, 24, 31-48.

101) Leong, C., (2007), "*A Tale of Two Countries: Openness and Growth in China and India."* DEGIT conference paper.

102) Long Jason L., (2002), "*Labour Mobility in Victorian Britain."* Ph.D. Dissertation, North-western University.

103) Lorentzen, J., P. Mollgaard, and M. Rojec, (2003), *Host-Country Absorption of Technology: Evidence from Automotive Supply Networks in Eastern Europe.* Industry and Innovation. 10(4) p. 415-432.

104) Lucas, R., (1988), *On the Mechanics of Economic Development.* Journal of Monetary Economics, 22(1), 3-42.

105) Luiz, J. M., (2003), *The Relevance, Practicality and Viability of Spatial Development Initiatives: A South African Case Study.* Public Administration and Development, 23:433-443.

106) Lundvall, B.A., (1992), *National Innovation Systems: Towards a Theory of Innovation and Interactive Learning*, London: Pinter.

107) Madani, D., (1999), *A Review of The Role and Impact of Export Processing Zones.* World Bank Development Policy Research Working Paper 2238, (pp. 7–8). Washington, DC: World Bank.

108) Madanmohan, T. R., U. Kumar and V. Kumar, (2004), *Import-Led Technological Capability: A Comparative Analysis of Indian and Indonesian Manufacturing Firms.* Technovation, vol. 24 p. 979-993.

109) Madhok, A. (1997), *Cost, Value and Foreign Make Entry: The Transaction and the Firms.* Strategic Management Journal*, 18*, 39-61.

110) McCallum Jamie. K., (2011), *Export Processing Zones: Comparative Data from China, Honduras, Nicaragua and South Africa,* Industrial and Employment Relations Department, Working Paper No. 21, International Labour Office, Geneva, March.

111) McGrath. J. and A. Whiteside, (1989), *Industrialisation and Investment Incentives in Southern Africa.* University of Natal Press, James Curry Publishers.

112) Meagher, K. (2010), *Identity Networks: Social Networks and the Informal Economy in Nigeria*. New York: Boydell and Brewer.

113) Menrad, K., (2004), *Innovations in the Food Industry in Germany.* Research Policy, 33: 845-878.

114) Meyer-Stamer, Jorg, (1998), *"Path Dependence in Regional Development: Persistence and Change in Three Industrial Clusters in Santa Catarina, Brazil."* World Development 26 (8):1495–511.

115) Ministry of Commerce, Trade and Industry (MCTI), (2007), *Manufacturing Sector Survey 2000 – 2001, Final Report, June*. Accessed on 19th November, 2011 at http://www.mcti.gov.zm/index.php/investing-in-zambia/multifacility-economic-zones/90-location-of-mfez.

116) Ministry of International Trade and Industry (MITI) (2010). *Malaysia International Trade and Industry Annual Report Year 2009*.

117) Mowery, D.C. and J.E. Oxley, (1995), *Inward Technology Transfer and Competitiveness: The role of national innovation systems.* Cambridge Journal of Economics 19, 67-93.

118) Müller-Seitz, G.., (2012), *Absorptive and Desorptive Capacity-Related Practices at the Network Level – The case of SEMATECH*. R&D Management, 42, 90-99. http://dx.doi.org/10.1111/j.1467-9310.2011.00668.x

119) Munankaampe, G.M., (2000), *An Analysis of the Performance of the Manufacturing Industry in Zambia - The Engineering Sub-sector, Master of Engineering Dissertation.* University of Zambia, Lusaka.

120) Murovec, N., and I. Prodan, (2009), *Absorptive Capacity, Its Determinants, and Influence on Innovation Output: Cross Cultural Validation of the Structural Model. Technovation 29, 859-872. Http://Dx.Doi.Org/10.1016/J.Technovation.2009.05.010*

121) Mytelka, L., (2004), *"From Clusters to Innovation Systems in Traditional Industries."* In Innovation Systems and Innovative Clusters in Africa: Proceedings of a Conference ed. Mwamila, B.L., L. Troger, B. Diyamett and A. Temu, (2004), Bagamoyo, Tanzania.

122) Nadvi, K., (1999), *"Collective Efficiency and Collective Failure: The Response of the Sialkot Surgical Instruments Cluster to Global Quality Pressures."* World Development. 27 (9): 1605–26.

123) Nel, E.L and C.M. Rogerson, (2013), *Special Economic Zones in South Africa: Reflections from International Debates.* Urban Forum 24(1): 205-271.

124) Nooteboom, B. (2000), *'Learning by Interaction: Absorptive Capacity, Cognitive Distance and Governance'*. Journal of Management and Governance, Vol. 4, No. 1, pp.69–92.

125) Nurrul Indorti, (2010), *The Effects of Knowledge Stickiness and Interaction on Absorptive Capacity: Evidence from Furniture and Software Small- and Medium-Sized Enterprises in Indonetia.* University of Groningen, The Netherlands.

126) Omar, K., and W. Stoever, (2008), *"The Role of Technology and Human Capital in the EPZ Life-cycle."* Transnational Corporations 17 (1) (April): 135–60.

127) OECD, (2005), *Encouraging Linkages Between Small and Medium-Sized Companies and Multinational Enterprises.* DAF/INV/WD (2005)12/REV1, Paris.

128) OECD, (2007), *Globalisation and Regional Economies: Can OECD Regions Compete in Global Industries?* OECD Reviews of Regional Innovation. Paris.

129) Porter, M.E., (1990), *The Competitive Advantage of Nations.* Macmillan: London.

130) Rastogi, P.N., (2002), *Knowledge Management and Intellectual Capital as a Paradigm of Value Creation*. Human Systems Management, 21(4). 229-240.

131) Rothwell, R. and M. Dodgson, (1991), *External Linkages and Innovation in Small and Medium-sized Enterprises.* R&D Management 21, 125-137.

132) Ruan, J., and X. Zhang, (2008), *"Finance and Cluster-based Industrial Development in China."* Discussion Paper 768, International Food Policy Research Institute, Washington, DC.

133) Ruzzier, M.R., D. Hisrich and B. Antoncic, (2006), *SME Internationalisation Research: Past, Present and Future.* Journal of Small Business Enterprise Development, Vol. 13, n° 4, 476-497.

134) Sarkar Jayati, (1998), *Technological Diffusion: Alternative Theories and Historical Evidence.* Indira Gandhi Institute of Development Research, Journal of Economic Surveys Vol. 12, No. 2, Blackwell Publishers Ltd. UK.

135) Sawkut, R., S. Vinesh, and F. Sooraj, (2009), *The Net Contribution of the Mauritian Export Processing Zone Using Cost-Benefit Analysis*. Journal of Development Economics, 21, pp. 379-392.

136) Schmidt, T., (2010), *Absorptive Capacity—One Size Fits All? A Firm-Level Analysis of Absorptive Capacity for Different Kinds of Knowledge.* Managerial and Decision Economics, 31, (1): 1-18.

137) Shefer, D. and A. Frenkel, (2005), *R&D, Firm Size and Innovation: An Empirical Analysis.* Technovation, 25: 25-32.

138) Shen X, and S. Xu, (2011), *Shenzhen Special Economic Zone: A Policy Reform Incubator for Land Market Development in China*. Washington, DC: World Bank.

139) Stein, H. (2008), *Africa, Industrial Policy and Export Processing Zones: Lessons from Asia. Paper Prepared for Africa Task Force Meeting,* Addis Ababa, Ethiopia 10-11 July.

140) Supnithadnaporn, A. and T. Jung, (2007), *Testing Schumpeterian Hypothesis with Data from a Developing Country: R&D Investment and Size of Firms in Thailand*. Atlanta Conference on Science, Technology and Innovation Policy. Atlanta, GA, IEEE.

141) Suarez-Ortega, S.S., and F. Alamo-Vera, (2005), *SMES' Internationalisation: Firms and Managerial Factors*, International Journal of Entrepreneurial Behaviour and Research, 11 (4), 258-279.

142) Tangri, R., (1999), *The Politics of Patronage in Africa*. Oxford: James Currey Ltd.

143) Traill, B. and K.G. Grunert, (1997), *Product and Process Innovation in the Food Industry.* London, UK: Chapman and Hall.

144) United Nations Conference on Trade and Development UNCTAD, (1999), *World Investment Report 1999: Foreign Direct Investment and the Challenge of Development.* New York/Geneva.

145) UNCTAD, (2001), *Investment Policy Review of Mauritius.* New York and Geneva, United Nations Publications Sales No. E.01.II.D.11 ISBN 92-1-112521-9.

146) UNCTAD, (2003). *Effectiveness of Foreign Direct Investment Policy Measures.* (TD/B/COM.2/EM.13/2, 22 April, 2003).

147) UNCTAD, (2005), *World Investment Report 2005: Transnational Corporations and the Internationalisation of R&D*. New York and Geneva: United Nations.

148) UNCTAD, (2006), *Promoting TNC-SME Linkages to Enhance the Productive Capacity of Developing Countries' Firms:* A Policy Perspective, TD/B/COM.3/75. UNITED NATIONS New York and Geneva.

149) United Nations Industrial Development Organisation (UNIDO), (2009), *Industrial Development Report 2009.* New York: UNIDO.

150) United Nations, (2008), *International Standard Industrial Classification of All Economic Activities (ISIC) Rev.4*. Statistical Papers, Series M, No.4/Rev.4.

151) UNCTAD, (2011), *World Investment Report. Non-Equity Modes of International Production and Development.* United Nations, Geneva.

152) Vanessa Tang, (2008a), *South Africa's Economic Miracle – Has the Emperor Lost His Clothes?* Annual Forum.

153) Vanessa Tang, (2008b), *Zoning in on South Africa's Industrial Development Zones.* School of Economics and Finance University of KwaZulu-Natal – TIPS Annual Forum, October.

154) Wagner, F.W., T.E. Joder and A.J. Mumphrey, (2003), *Human Capital Investment for Central City Revitalization.* Routledge.

155) Walker, D.H.T., T. Maqsood and A. Finegan, (2005), *'The Culture of the Knowledge Advantage (K-Adv): A Holistic Strategic Approach to the Management of Knowledge',* in A. S. Kazi (Ed.), *Knowledge Management in the Construction Industry: A Socio-Technical Perspective*, Idea Group Publishing, London.

156) Watson, Peter. L., (2001), *Export Processing Zones: Has Africa Missed the Boat? Not Yet!* Africa Region Working Paper Series No. 17. World Bank, Washington, DC.

157) Welch, L. S., and R. Luostarinen, (1988), *Internationalisation: Evolution of a Concept.* Journal of General Management, *14*(2), 34-55.

158) Wie, T.K., (2003), *The Major Channels of International Technology Transfer to Indonesia: An Assessment.* Conference on Catch-Up Growth and Technology Transfer, University of Groningen, Groningen.

159) Willmore. L., (1995), *Export Processing Zones in the Dominican Republic: A Comment on Kaplinsky.* World Development 23 (3): 529–35.

160) White, J. (2011). *Fostering Innovation in Developing Economies through SEZs.* Special Economic Zones, 183.

161) Wolff, E. N., (2001), *The Role of Education in the Post-war Productivity Convergence among OECD Countries.* Industrial and Corporate Change, 10 (3), 735-59.

162) World Bank, (2007), *African Development Indicators*. Washington, DC. USA.

163) World Bank, (2009), *World Development Indicators*. Washington, DC. USA.

164) World Bank, (2010), *World Development Indicators Database.* World Bank, Washington, DC.

165) World Economic Forum, World Bank, and African Development Bank, (2009), *The Africa Competitiveness Report 2009.* Geneva, Switzerland: World Economic Forum.

166) Yanfwa. F.K., (2001), *Improving Manufacturing Performance in Least Developed Countries. Case Study of Zambia, PhD Thesis*. Eindhoven University of Technology, Netherlands.

167) Yeung, Yue-man, J. Lee, and G. Kee, (2009), *"China's Special Economic Zones at 30."* Eurasian Geography and Economics, 50 (2): 222–40.

168) Zafar Ali, (2011), *Mauritius: An Economic Success Story*. World Bank Group Research Initiative by the Office of the Chief Economist, Africa Region on the Africa Success Stories Project, January 2011. World Bank.

169) Zahra, S.A. and G. George, (2002), *Absorptive Capacity: A Review, Re-conceptualisation and Extension.* Academy of Management Review, (2): 185-203.

170) Zeng Douglas Zhihua, (2008). *Knowledge, Technology and Cluster-based Growth in Africa.* Washington, DC: World Bank.

171) Zeng, D.Z., (2011), *"How Do Special Economic Zones and Industrial Clusters Drive China's Rapid Development?,"* The Finance and Private Sectors

Development, Africa Region, Policy Research Working Paper, 5583, March 2011, The World Bank.

172) Zeng Douglas Zhihua, (2012), *SEZs in Africa: Putting the Cart in Front of Horse? (blog).* Washington, DC: World Bank. Economic Premise.

WEBSITES

1. http://www.mcti.gov.zm/index.php/investing-in-zambia/multifacility-economic-zones/90-location-of-mfez accessed on 19/11/2011
2. http://www.zda.org.zm/?q=content/multi-facility-economic-zone-mfez accessed on 07/10/2011
3. http://www.uneca.org accessed on 29/12/2011
4. http://www.coega.co.za/files/fil3ddbo-coega%20Annual%20report.pdf accessed on 29/12/2011
5. http://www.elidz.co.za accessed on 30/12/2011
6. http://www.gov.mu accessed on 29/03/2011
7. http://www.reiz.co.zm accessed on 10/05/2011
8. http://www.chinafair.org.cn accessed on 22/05/2011
9. http://www.ecdc.co.zm accessed on 18/11/2011
10. *http://*www.info.gov.za2012 accessed on 03/04/2012
11. http://www.thedti.gov.za accessed on 03/04/2012
12. http://www.oecd.org/development/perspectivesonglobaldevelopment/45068325.1 accessed on 03/05/2012
13. http://zm2.mofcom.gov.cn/accessory/201012/1291405812487 accessed on 08/05/2012
14. http://www.timeslive.co.za/africa/article476602.ece/Whats-good-for-China-could-be-good-for-Africa accessed on 31/07/2012
15. http://www.data.worldbank.org/indicator/NV.IND.MANF.ZS accessed on 23/07/2012
16. https://www.worldbank.org/data/wdi2009/index.htm accessed on 23/07/2012
17. http://www.dpmf.org/images/public-policy-mgt-njunga.html accessed on 19/11/2012
18. http://www.gidz.co.za accessed on 19/12/2012
19. http://www.gov.za/mafikeng-industrial-development-zone-2012 march 28 accessed on 23/12/2012
20. http://www.rbidz.co.za accessed on 28/12/2012
21. Coega(2008)'Coega Development Corporation Annual Report 2007' http://www.coega.co.za/files/fil3ddbo-coega%20Annual%20report.pdf
22. http://www.southsouthcases.info accessed on 28/12/2012

APPENDICES

Appendix 1: Map of Zambia – MFEZs and IPs Profiles and Locations

Appendix 2: Infrastructure Framework and Aerial View of the Chambishi MFEZ

Shaft of NFCA

Concentrator of NFCA

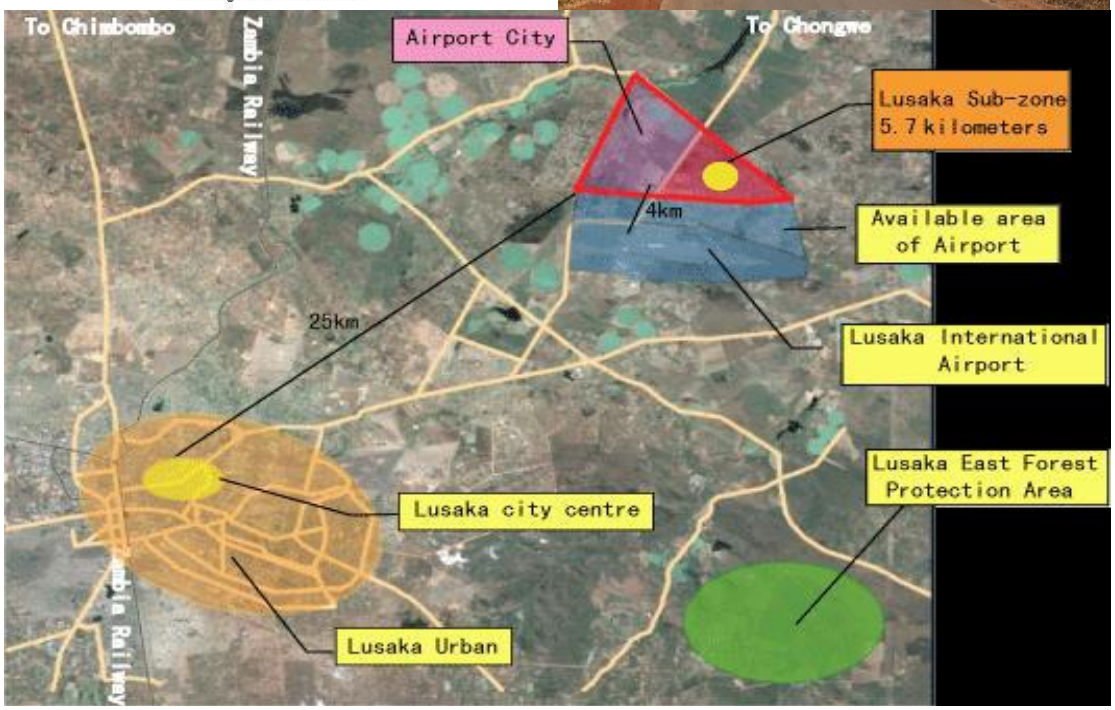
Sino Metals Leach (Zambia) Limited

ISA Furnace of CCS

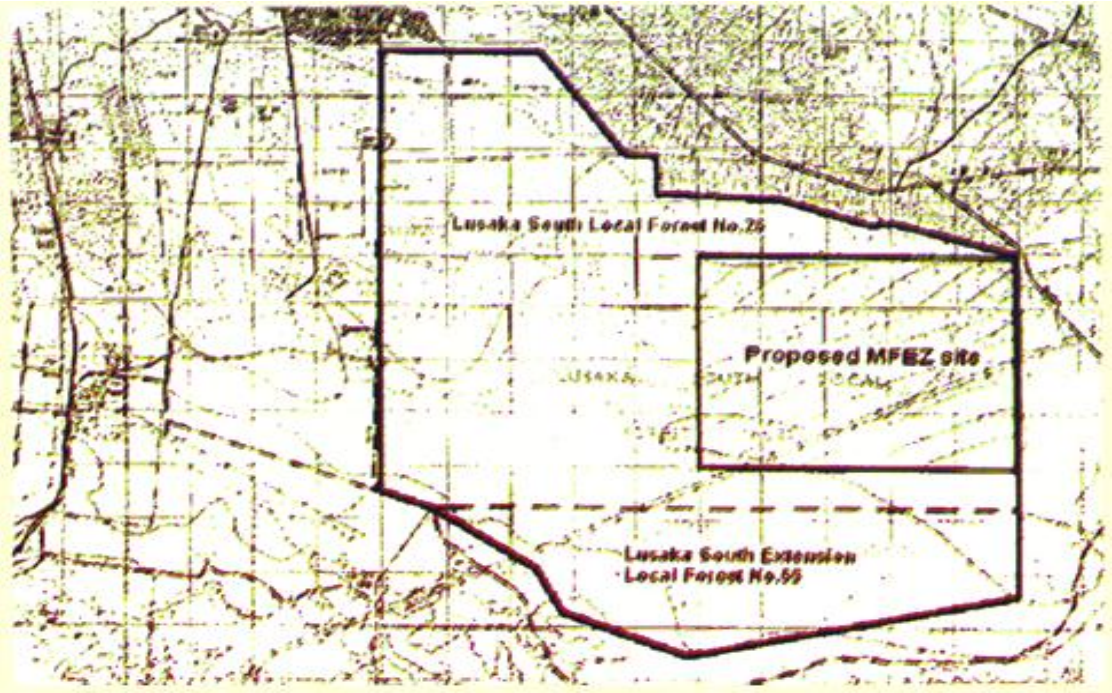
Rendering of the Center of Chambishi MFEZ

Appendix 3: Lusaka East/Sub-Zone Infrastructure Framework and Aerial View

Rendering of Lusaka East MFEZ

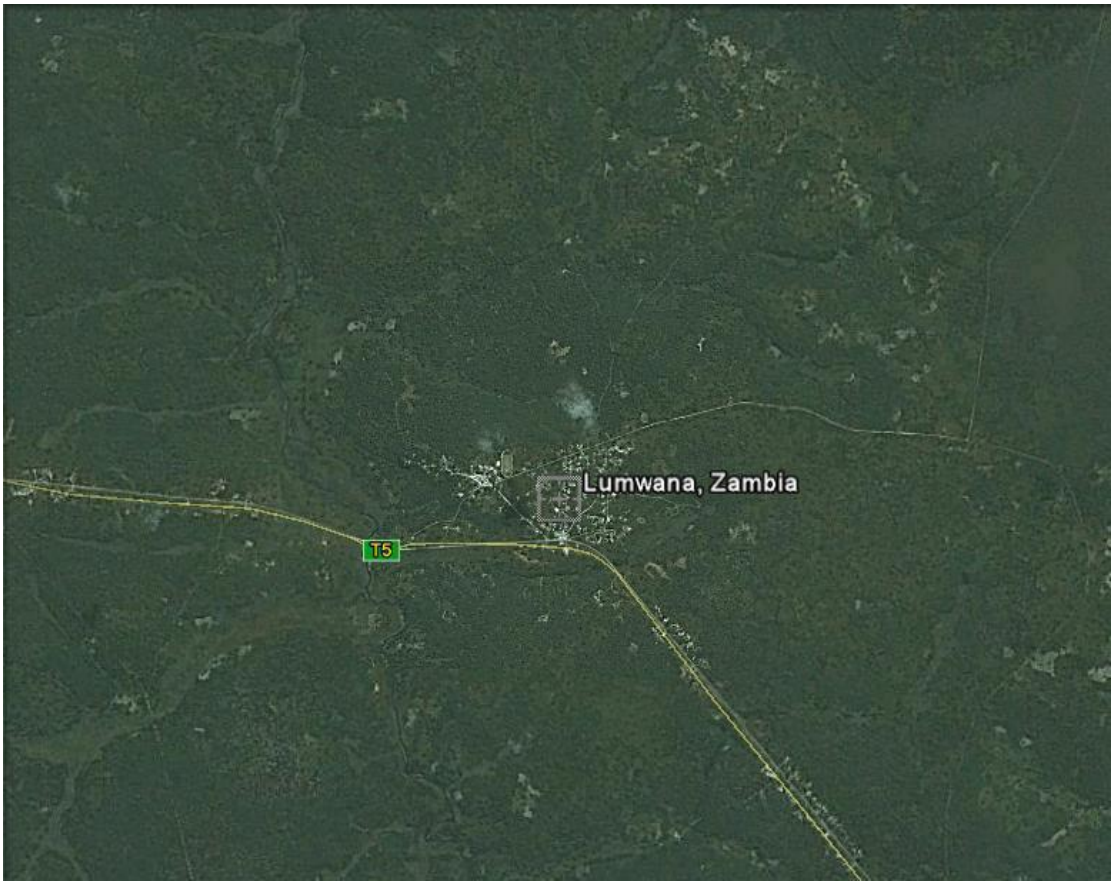


Appendix 4: Lusaka South MFEZ Aerial Views



Front View of the Lusaka South MFEZ

Appendix 5: Lumwana MFEZ Aerial View



Appendix 6: Aerial View and Infrastructure Framework of SSGE Industrial Park

Oil Refinery

Light Manufacturing

Dry Port and Container Deport

Warehousing and Logistics

Appendix 7: Roma Industrial Park Aerial View

Appendix 8: Study Population and Sample Size by Name

S/N	Name of Organisation	Manufacturing Sub-sector/ Industry	Town/City	Questionnaires	
				Issued	Answered
1	Tombwe Processing	Food, Beverages & Tobacco	Lusaka	✓	Yes
2	Midlands Breweries	"	Lusaka	✓	Yes
3	Heinrich's Beverages	"	Lusaka	✓	Yes
4	ZAMANITA	"	Lusaka		Not Willing
5	ZAMBEEF PLC	"	Lusaka	✓	Not Willing
6	National Milling Corporation	"	Lusaka	✓	Yes
7	BML Trading (Mineral Water)	"	Kitwe	✓	Yes
8	Zambian Breweries PLC	"	Lusaka		Not Willing
9	Parmalat Zambia	"	Lusaka	✓	Not Willing
10	Kabwe Industrial Fabrics Co	Textile/Apparel/Leather "	Kabwe	✓	Yes
11	Dunavant	"	Chipata		Not Willing
12	Cargill	"	Chipata	✓	Yes
13	Kariba Textiles	"	Livingstone	✓	No
14	Alliance One	"	Chipata/Lusaka		No
15	Zammleather	"	Lusaka		No
16	Zamshu	"	Lusaka		Not Willing
17	Unified Chemicals Ltd	Chemicals & allied Products	Lusaka	✓	No
18	Plascon Kansai Paints	"	Lusaka		Not Willing
19	Trade Kings Ltd	"	Lusaka	✓	Not Willing
20	Bimbe Trading	"	Lusaka	✓	Yes
21	Dulux Paints	"	Lusaka	✓	Yes
22	Sakky Enterprises	Paper and Paper Products	Lusaka	✓	Yes
23	Nampak Zambia	"	Lusaka	✓	Not Willing
24	Mukatasha Timber Products	Wood/Lumber and Products	Lusaka		Not Willing
25	Polyethene Products (Z)	Plastics and Rubber products	Lusaka	✓	Yes
26	M and F Packaging	"	Lusaka	✓	Yes
27	Lamasat Industries	"	Lusaka	✓	Yes
28	Nisco Industries	"	Lusaka	✓	Yes
29	Reba Indusrial Corporation	Fabricated metals & products	Kalulushi		Not Willing
30	Barlow World Ltd	"	Lusaka	✓	No
31	Hitachi Machinery Construction	"	Lusaka		Not Willing
32	Tayyab (Bimalu Zambia)	"	Lusaka	✓	Yes
33	Melticast Engineering Ltd	"	Kitwe	✓	Yes
34	ZAMEFA	"	Luanshya	✓	No
35	Safintra Zambia	"	Lusaka	✓	Yes
36	MM Integrated Steel Mills	"	Lusaka	✓	Yes
37	Afil Engineering	Automobiles/Components Spares Industrial/Machinery	Lusaka		Not Willing
38	Chilanga Lafarge PLC	Paving, Construction, Non-metallic/Mineral Products	Lusaka	✓	No
39	Road and Paving Zambia	"	Lusaka		Not Willing
40	Specialised Systems	Electronic/Electrical/ICT equipment	Lusaka		Not Willing
41	Electrical Meters	"	Ndola		Not Willing
42	Sino Metals Leach	Primary Metals/Mining	Kalulushi	✓	Yes
43	NFCA	"	Kalulushi	✓	Yes
44	Chambishi Copper Smelter	"	Kalulushi	✓	Yes
45	Lumwana Mine	"	Solwezi		Not Willing

Appendix 9: Questionnaire Sample

THE UNIVERSITY OF ZAMBIA

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTIONNAIRE

Title: Opportunities and Challenges of Zambia's Manufacturing Sector in the Wake of the Proposed Multi-Facility Economic Zones.

Dear Respondent,

You have been randomly selected. Therefore, I kindly ask you to take some time from your busy schedule to fill in this questionnaire as accurately and truthfully as possible. Your responses will be treated with high confidentiality.

Purpose/objective: To provide information for developing reference integrated model for industry linkages (inclusion into the MFEZ value-chain).

I wish to declare and confess that the data/information to be collected on individual firm and facility in this research is purely and solely for academic purposes and will be given utmost confidentiality it deserves.

Thank your for your time and generous co-operation.

Yours truly,

SIKOZI KAZWALA. E
(+260 971 713 135/+260 966 794 700)

INSTRUCTIONS

Please, tick e.g. [√], where the bracketed space has been provided, and write your answers where spaces have been provided.

SECTION 1 RESPONDENT COMPANY PROFILE

1.1 Company Name: ……..

1.2 Physical Address: Plot No.: …….

Road/Street: ……

Town: …….

Telephone: ……

E-mail: ……

Website: ……

1.3 Date of Establishment: ..…/……/……

1.4 Position of Respondent ……

1.5 Type of Main Manufacturing Activity and/ or Business:

a) Food, Beverages and Feed	[ ]	i) Primary Metals	[ ]
b) Textiles/Apparel/Leather	[ ]	j) Fabricated Metals and products	[ ]
c) Chemicals and Allied Products	[ ]	k) Industrial Machinery and Spares	[ ]
d) Paper and Paper Products	[ ]	l) Transportation Equipment & Spares	[ ]
e) Wood/Lumber and Products	[ ]	m) Components and Spares	[ ]
f) Plastics and Rubber Products	[ ]	n) Electronic/Electrical/ICT equipment	[ ]

g)Non-metallic and Mineral Products (stone, clay, glass or concrete) [ ]

h)Others (please specify) …… [ ]

1.6 Please indicate the approximate number of product lines at your firm's facility ……

1.7 Production Capacity and Utilisation Levels:

Product Name	Design Capacity	Average Actual Production
a) ……	……..	……
b) ……	……..	……
c) ……	……	……

1.8 Raw Materials and Other Inputs:

	Name/Type	Source (i)			Transportation (ii)			
		Local	Imported	Both	Air	Rail	Road	Marine
a	Primary							
b	Secondary							
c	Consumables							
d	Tools & Components							
e	Spare Parts							

If imported, please indicate the source and state the reason in terms of cost implications:

……

'*Continued*'

SECTION 2

KNOWLEDGE OF MULTI-FACILITY ECONOMIC ZONES (MFEZs) & INDUSTRIAL PARKS (IPs)

2.1 Have you ever heard of any MFEZ/IP in Zambia?
- a) YES [ ]
- b) NO [ ]

2.2 According to your knowledge on the MFEZ/IP, is it a good concept to be implemented in Zambia?
- a) YES [ ]
- b) NO [ ]
- c) NOT SURE [ ]

2.3 If the answer to question 2.2 is YES, what expectations do you have with the implementation of MFEZ/IP in Zambia?
- a) To enhance value addition [ ]
- b) To reduce the cost of manufacturing [ ]
- c) To increase the quality of manufactured products [ ]
- d) To increase productivity [ ]
- e) None [ ]
- f) Other (Specify) …….. [ ]

2.4 If the answer to question 2.2 is NO, please state the reason.

……

2.5 From the following list of MFEZs/IPs, which one (s) would be appropriate for your firm? [Check (All those applicable)]
- a) Chambishi [ ]
- b) Lusaka South [ ]
- c) Lusaka Sub-Zone [ ]
- d) Lusaka East [ ]
- e) Lumwana [ ]
- f) Roma Industrial Park (Lusaka) [ ]
- g) Sub-Sahara Gemstone Park (Ndola) [ ]
- h) None [ ]

2.6 If the answer to question 2.5 is NONE, please state the suitable location for your perceived MFEZ/IP.

……

2.7 It is anticipated that the implementation of the MFEZ/IP in Zambia will accelerate economic growth through technological transfer, job creation, enhanced competitiveness and increased foreign exchange earnings, what difficulties/problems do you anticipate in achieving the said objectives? [Check (All those applicable)]
- a) Little support from government especially to local manufacturing firms [ ]
- b) Lack of knowledge and skills in implementation [ ]
- c) Lack of policy guidelines [ ]
- d) Limited technology capacity to adopt and then adapt the concept [ ]
- e) Other (Specify) …….. [ ]

2.8 What benefits do you think would be realised if your firm was relocated into the MFEZ/IP?

……

2.9 One of the enforceable policies in MFEZs/IPs in other countries is for every expatriate there is need to employ 9 locals, in your opinion, do you think it is important to have a similar policy on the implementation of MFEZ/IPs in Zambia?
- a) Not important at all [ ]
- b) Little importance [ ]
- c) Great Importance [ ]

'Continued'

2.10 What recommendations would you suggest with regard to making MFEZ/IP a success story in Zambia? [Check (All those applicable)]

a) Encourage other firms to emulate best practices of FDI firms [ ]
b) Government must set up awareness campaign teams to market MFEZ concept to local industries [ ]
c) Government must ensure that MFEZs' incentives are more attractive and accessible to both locally-owned and FDIs [ ]
d) Others (Specify) …… [ ]

SECTION 3 TECHNOLOGICAL LEVELS, QUALITY STANDARDS AND PRODUCTIVITY

(This Section looks at the awareness and use levels of Technologies and Quality Management Systems in industries. Automation is the technology which is concerned with the application of mechanical, electronic and computer-based programmes to plan, operate and control production and manufacturing processes in order to increase efficiency, while Mechanisation refers to the act of implementing the control of equipment with advanced technologies, where machines replace human labour)

3.1 How would you classify the machinery and equipment in your firm's plant/factory?

a) General- purpose [ ]
b) Special- purpose [ ]
c) Both [ ]

3.2 Are the following manufacturing technologies, technological innovations, practices and manufacturing systems employed in your plant? [Check (Tick where applicable)]

If Use, please tick [√] & indicate Year Use began, and check the box if you Plan to Expand Use to other areas Within 2 years.
If Not Use, please indicate [√], whether you plan to use it Within 2 years. If Not, check Why not.

Manufacturing Technologies	**Use**			**Do Not Currently Use**		
	Currently Use	Year Use Began	Plan to Expand Use	Plan to Use	Economically Infeasible	Not Applicable
Design & Engineering:						
a) Computer Aided design/Engineering (CAD/CAE)						
b) Computer-Aided Design/Manufacturing (CAD/CAM)						
c) Modeling & Simulation technology						
Processing, Fabrication & Assembly:						
d) CNC Controlled machines						
e) Programmable Logic Controllers (PLC)						
f) Robotics with Sensing capabilities						
g) Robotics without Sensing capabilities						
h) Flexible Manufacturing Systems (FMS)						
Material Handling:						
i) Automated Part Identification for manufacturing (e.g. bar coding)						
j) Automated Storage and Retrieval Systems (AS/RS)						
Inspection/Testing - Inputs/Outputs:						
k) Automated vision-based systems						
l) Other automated sensor-based systems						
Information/Network Communication:						
m) Local area network (LAN) for engineering and/or production						
n) Company-wide computer networks (Intranet and WAN)						
0) Electronic commerce purchasing & selling (Extranet and EDI)						
Integration and Control:						
p) Manufacturing Resource Planning II (MRP II)/Enterprise Resource Planning (ERP)						
q) Computer-Integrated Manufacturing (CIM) - on the factory floor						
r) Digital-remote controlled process plant control (e.g. Fieldbus)						

Technological Innovations, Practices & Manufacturing Systems:						
a) Teamwork/Cross-functional design						
b) Flatter organizational structures						
c) Employee Continuous Improvement/TQM and Problem-solving						
d) Simultaneous or Concurrent engineering						
e) Just-in-time (JIT) inventory control						
f) Electronic work order management/ E-Kanban						
g) Benchmarking						
h) Lean Production						
i) Business Process Re-engineering (BPR)						
j) Cellular Manufacturing						
k) Distribution Resource Planning (DRP)						
l) Plant Quality Certification QMS: ISO 9000 & Family						
: Hamornised (SADC, COMESA)						
: ZABS Standards						
m) Environmental Management Quality Certification (e.g. ISO 14000)						
n) Certification of suppliers						

3.3 What difference/impact has the Quality Certification Scheme made on the overall status of your firm?

a) Improved market share [ ]
b) Reduced cost of manufacture [ ]
c) Unleashed worker productivity [ ]
d) None [ ]
e) Other (Specify) ……. [ ]

3.4 What expectation do you have in using Quality Certification Scheme?

a) To enhance manufacture of competitive products [ ]
b) To increase customers' wider choice of quality goods [ ]
c) To improve sales [ ]
d) None [ ]
e) Other (Specify) ……. [ ]

3.5 What is the targeted market for your products?

a) Local market [ ]
b) Foreign Market [ ]
c) Both [ ]

3.6 Do you offer value-added services to your customers such as training for your product(s), maintenance of your product(s), arrangement of financing, or other services?

a) YES [ ]
b) NO, plan to offer [ ]
c) NO, do not plan to offer [ ]

3.7 One of the important characteristics in assessing changes in local manufacturing is value-added per employee, which is used as a measure of productivity. It is obtained from sales revenue less the total cost of purchased materials and services. Please give the estimates for firm's facility.

	2009	2010	2011
What were the total annual sales or gross value of shipments at plant in fiscal years indicated?			
How much did you spend at the current location on purchased materials, parts and services in fiscal years indicated?			

3.8 Please indicate the importance levels of the following factors in your firm's business strategy

Factors	**Importance Levels**				
	Very Low	Low	Moderate	High	Very High
	1	2	3	4	5
Products and Marketing					
a) Developing new products					
b) Improvement of existing products					
c) Entering new markets					
d) Improvements in marketing and selling					
e) Value-added services (e.g. training of customer staff, maintenance)					

Technology/Methods					
f) Improvements in manufacturing processes					
g) Reduction in manufacturing costs					
h) Using new materials					
i) Developing or investments in new machinery & equipment (technologies)					
j) Investments in information technology systems					
Human Resources					
l) Team-based manufacturing systems (e.g. cross-functions, flatter structures)					
m) Personnel strategies (e.g. on-going technical training, pay-for-skills)					

3.8 From the answers given for questions 3.2 and 3.8 (Tables) in Section 3, please indicate which key or critical success factors that you think will enable the local manufacturing firms to be integrated in the MFEZ/IP/SEZ/IDZ value-chain.

……

……

……

SECTION 4 SKILLS AND HUMAN RESOURCE STOCK

(The Section looks at current skills, knowledge and human resource levels and the ability to meet dynamic trends in technology, which is an integral component in MFEZs' success)

4.1 What is your firm's annual labour turnover?

a) Less than 10% [ ]
b) 11 – 20% [ ]
c) Not Sure [ ]

4.2 Employment Categories:

	Actual Numbers	
	Local	Expatriates
a) Higher Managerial, Administrative or Professional	……	…….
b) Middle Managerial. Administrative or Professional	……	…….
c) Highly skilled Labour	……	…….
d) Semi-skilled Labour	……	…….
e) Unskilled Labour	……	…….

4.3 Technical:

a) Engineers	……	…….
b) Technologists	……	…….
c) Technicians	……	…….
d) Craftsmen/Artisans	……	…….
e) Operatives	……	…….
f) Research and Design Section	……	…….

4.4 Educational/Professional Qualifications:

Category	Level of Educational/Professional Qualifications			
	Degree	Diploma	Craft Certificate	Any other
a) Top Management	[ ]	[ ]	[ ]	[ ]
b) Supervisory/Middle	[ ]	[ ]	[ ]	[ ]
c) Shop-floor	[ ]	[ ]	[ ]	[ ]

4.4.1 If you ticked on any other, please specify ……

4.5 How is decision-making process structured in your organisation?
- a) Centralised [ ]
- b) Decentralised [ ]

4.6 Is there any Staff or Career Development Programme in place for employees?
- a) YES [ ]
- b) NO [ ]

(If the response is NO, please go to question 5.0)

4.7 If the response to question 4.7 is YES, what type of training is conducted?
- a) On-the job training [ ]
- b) Off-the job training [ ]
- c) Both [ ]

4.8 If the response to question 4.7 is (b), please indicate the place where training is provided

……

4.9 If the response to question 4.6. is NO, please indicate:

i. The source of trained of personnel: ……

ii. Type of training required: ……

5 Do the current labour skills meet your firm's production technology?
- a) YES [ ]
- b) NO [ ]

END OF THE QUESTIONNAIRE!

YOUR ASSISTANCE IS GREATLY APPRECIATED