NEW INDUSTRIAL SPACES IN KENYA: A CASE STUDY OF EXPORT PROCESSING ZONES IN NAIROBI AND ATHI RIVER

BY

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

In memory of my mentors Mr Benford Lumbasi Opanda and my sister Beatrice Munde…….…… in recognition of their love, care, encouragement and support they gave me throughout my academic endeavors…

MAY THE LORD REST THEIR SOULS IN ETERNAL PEACE….

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ABSTRACT

This study aims at determining whether the Export Processing Zones (EPZs) are "new industrial spaces" in Kenya by analyzing their evolutionary, structural and operational characteristics. The concern here being to determine whether there are similarities and or differences amongst the EPZ firms in terms of their structural characteristics, linkage capabilities and marketing strategies. The regulation approach and the product cycle model were employed in understanding the evolutionary and operational characteristics of the EPZs in Kenya.

The findings of this study are based on information gathered from a sample of 25 EPZ firms and 250 employees. The technique employed in acquiring the samples for employees was stratified random sampling. Primary data was gathered by use of standardized questionnaires, while secondary data was obtained from government publications and Export Processing Zones Authority (EPZA) reports. In the analysis and presentation of the field data both qualitative and quantitative techniques were employed. In assessing the linkages between EPZ firms and the host economy, Corden's (1974) enclave approach was employed. It was used descriptively in assessing the linkage capabilities between the EPZs and the host economy. Finally, common factor analysis was utilized in determining the significant survival strategies utilized by EPZ firms in the competitive world market economy.

The findings indicate that like the new industrial spaces in North America and Western Europe, EPZ firms in Kenya exhibit similar structural and operational characteristics. For instance most EPZ firms are foreign owned, depend on labor-intensive technology, rely on imported inputs, are export oriented, manufacture mature products and most of them are either small or medium size firms. The EPZ firms in Kenya utilize the same survival strategies in a competitive world market economy. The most significant strategies utilized are production of quality goods, use of cheap non-unionized labor, standardization of production processes, locational mobility and reliance on EPZ incentives.

The findings also indicate that the contribution of EPZs on the host economy has not been very significant. For instance, employment creation in the EPZs has been very low as evidenced in

the small numbers of people employed in the firms. Backward and forward linkages have not been achieved due to over-dependence of the EPZ firms on foreign inputs and external markets. Technological transfer by EPZ firms has not been very significant because of the substantial protection by patents, the low technological level of labor-intensive production and lack of skilled labor. Therefore, the enclave nature of EPZs has denied the host economy the anticipated benefits expected from EPZ firms.

This study recommends that in order for Kenya to achieve integrated national development through strategies such as EPZs and to transform them into viable industrial development tools, there is need to: select industries with strong backward and forward linkages; invest in promotion programs to encourage both marketing and production skills between EPZs and the host economy; encourage local manufacturers to produce quality goods to be able to supply the EPZ firms; and engage in continuous assessments to determine and evaluate the success of the EPZ program.

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Abbreviations

AGOA	African Growth and Opportunity Act
EDP	Export Development Program
EoI	Export oriented Industrialization
EPC	Export Promotion Council
EPZA	Export Processing Zones Authority
EPZs	Export Processing Zones
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
ILO	International Labor Organization
IPC	Investment Promotion Council
ISAP	Industrial Sector Adjustment Program
ISI	Import Substitution Industrialization
LDCs	Least Developed Countries
MDCs	Most Developed Countries
MFA	Multi-Fiber Arrangement
MNCs	Multinational Corporations
MUB	Manufacturing Under Bond
NICs	Newly Industrializing Countries
RoK	Republic of Kenya
SAPs	Structural Adjustment Programs
UK	United Kingdom
UNCTAD	United Nations Centre for Trade and Development
UNIDO	United Nations Industrial Development Organization
USA	United States of America
WEPZA	World Export Processing Zones Authority

1. INTRODUCTION

1.0 Overview

Since independence, the Kenyan economy has experienced a number of cycles of growth followed by downturns and stagnation. During the early years of independence, the country achieved commendable economic growth. For instance, the period 1964 to 1973, Kenya's gross domestic product (GDP) grew on average by 6.6 percent per year (Table 1.1). The rapid growth during the decade is attributed to the Import Substitution Industrialization Strategy (ISIS) supported by access to the East African Community markets and good macro-economic management (R.o.K 1986; 1997; Nyong'o, 1988; McCormick, 1995; Ita, 1995).

Table 1.1: Average Annual Growth Rates of Real Gross Domestic Product (1964-2000).

Sector	1964- 1970	1971- 1980	1981- 1990	1991 - 1995	1996 - 2000
Agriculture	4.6	3.9	3.3	0.4	1.1
Manufacturing	9.1	10	4.8	3	1.3
GDP	**6.6**	**5.2**	**4.1**	**2.5**	**2.0**

Source: Compiled from various Economic Surveys 1964-2001.

On a sectoral basis, between the periods 1964-1970 and 1971-1980, manufacturing increased from 9.1 to 10 per cent in terms of GDP. Growth in the sector was largely attributed to expanding domestic demand, supported by rising agricultural incomes, the encouragement of investment through high levels of protection and an active government role in industrial promotion and investment (R.o.K, 1986; 1996; 1997; McCormick, 1995).

However, the good performance that had been realized could not be sustained for most of the period after the oil crisis of 1972-1973 (Coughlin and Ikiara, 1988; Nyong'o, 1988; Sharpley and Lewis, 1990). Since the mid 1980s up to 2000, the performance of the economy has generally been poor as evidenced by the drastic decline in manufacturing and agriculture (Table 1.1). The decline in the manufacturing sector was attributed to weak incentive procedures, which favored production for the domestic market over production for export and to diminishing opportunities for efficient ISI strategy. The decline is further attributed to the growing inefficiency of public industrial investments, unsound economic policies and structural rigidities (R.o.K, 1986; 1996; 1997; Nyong'o, 1988; McCormick, 1995).

Low volumes of manufactured exports, relatively low employment creation and low foreign investments marked the decline in Kenya's manufacturing sector. Employment grew at an average of only 0.6 percent between the periods of 1964 to 1973 and 1974 to 1979 but after that

it has been on the decline (R.o.K, 1986; 1996; 1997). Recent employment growth rates have been far below the population growth rate and they have led to an accumulation of large numbers of openly unemployed people. Therefore, due to continued drastic declines in Kenya's manufacturing sector, there was need for an alternative strategy.

The strategy involved the restructuring of Kenya's industrial sector in order to stimulate investments as well as render it more export-oriented. The restructuring efforts involved the transition from the dominant ISI to the EoI and liberalization of the economy (R.o.K, 1986; 1996; 1997; McCormick, 1995; Ita, 1995). The introduction of an outward-oriented industrial development strategy was expected to remove the limitations of the inward-oriented strategy. This led to the setting up of various export promotional strategies aimed at stimulating industrial production for export, employment creation, increased foreign exchange earnings and investments (R.o.K, 1986; McCormick, 1995). The export platforms introduced included, the export compensation scheme, manufacturing under bond scheme (MUB), import duty exemption scheme, and the Export Processing Zones (EPZs).

The EPZs strategy was introduced in Kenya in 1990 as a major policy initiative to build upon and reinforce economic liberalization and restructuring efforts (R.o.K 1986; 1990; 1996; 1997; EPZA 1990; McCormick, 1995; Ita, 1995). EPZs are special industrial enclaves outside a nation's normal customs barriers and with special incentives to encourage firms to manufacture for export (Warr, 1989; EPZA, 1990; South, 1990; Grunwald, 1991). According to the Sessional Paper No. 2 of 1997 on *Industrial Transformation to the year 2020*, EPZs are viewed to be very effective tools in promoting industrial development and in attracting both foreign and domestic investors into the export industry especially in countries like Kenya, which lack the critical elements and technical expertise needed to facilitate and initiate an outward-oriented industrial development. They are analyzed in terms of their evolutionary process and operational characteristics. Like the *new industrial spaces* concept in the industrialized countries of Western Europe and North America which came into existence due to the transition in the modes of industrial production from fordism to post-fordism (Aglietta, 1979; Lipietz, 1986; Scott, 1988; Boyer, 1989; Scott and Storper, 1992) the EPZs in Kenya have evolved as a result of the transition from ISI to EoI (R.o.K, 1986; EPZA, 1990; McCormick, 1995; Ita, 1995).

1.1 Statement of the Research Problem

Industrial growth as experienced in South Korea and Taiwan, represents one of the developing countries' main hopes for rapid development in order to provide employment and improve the standards of living (Gilbert, 1990). According to Sagawe (1996) to attain industrialization status, four major types of manufacturing strategies have emerged. These are: import substitution policies favoring domestically oriented manufacturing for the national economy; artisan, small-scale, or informal industries producing goods for the local market; agro-industrial production processing agricultural output for export as well as for the national market; and export oriented industries focusing exclusively on international markets. The last strategy was successfully applied by many South East Asian countries (Frobel et al. 1980) and was copied by other Caribbean, Central American and African countries.

According to the Sessional Paper No. 2 of 1997 on *Industrial Transformation to the year 2020,* several strategies have been designed to achieve Kenya's industrialization dream. Key amongst them are those ones aimed at attracting foreign direct investment (FDI) into the country. EPZs feature prominently as a major strategy aimed at re-orienting Kenya's industrial production to external markets. On an international scale, numerous studies have been undertaken to assess the major contributions of EPZs in attracting FDI and their benefits to the host economy. However most of these studies have been confined to Latin American and South East Asian economies. Since the EPZ strategy is a new phenomenon in Kenya, the nature and characteristics of firms, their linkage capabilities with the host economy, and their survival strategies have not been adequately studied. The available empirical studies on the EPZ strategy in Kenya such as Chabari (2000), Mireri (2000), Malii (1998) and Mugambi (1997), lack a comprehensive analysis on aspects such as the structural characteristics, survival strategies and linkage capabilities of firms with the host economy. The present study investigates the structural and operational characteristics of EPZ firms with an aim of determining whether they can be referred to as new industrial spaces in Kenya. In essence, an attempt is made to answer the following questions, which constitute the problem of this study:

(i) What are the structural characteristics of EPZ firms in Nairobi and Athi River?

(ii) What types of linkages have evolved between the EPZ firms and the host economy?

(iii) Which strategies do these firms utilize in penetrating and remaining competitive on the world market?

1.2 Research Objectives

The main objective of this study was to determine whether EPZs can be referred to as new industrial spaces in Kenya. This study seeks to:

(i) Assess the structural characteristics of EPZ firms in Nairobi and Athi River.

(ii) Evaluate the linkages between EPZ firms and the host economy.

(iii) Investigate the marketing strategies utilized by EPZ firms in a competitive world economy.

1.3 Research Hypotheses

(i) There are no significant differences in the structural characteristics of EPZ firms in Nairobi and Athi River.

(ii) There are no significant linkages between the EPZs and the host economy.

(iii) There are no significant survival strategies utilized by EPZ firms in a competitive world market economy.

1.4 Justification of the Study

The recognition of the importance of the EPZs in Kenya is echoed in the 8th National Development Plan whose theme is *Rapid Industrialization for Sustained Development* and in Sessional Paper No.2 of 1997 on *Industrial Transformation to the year 2020*. According to the National Development Plan, EPZs are some of the major promotional instruments aimed at re-orienting the economy externally. However, although the EPZ formula is believed to be one of the instruments that can be used to partly steer industrial development in countries like Kenya which lack critical elements and technical expertise to re-orient their economies externally (Warr, 1989; South, 1990; Grunwald, 1991; Chandra, 1992; World Bank, 1992; Kaplinsky, 1993; Sander, 1998), it has not received much attention in terms of empirical studies.

Furthermore, being a recent industrial development strategy in Kenya, it needs more research in order to gauge its benefits to the host economy. Although several studies have focused on the potential and contribution of this strategy to the industrial development of a host economy (Warr, 1989; South, 1990; Grunwald, 1991; Chandra, 1992; Sander, 1998) most of their findings have been confined to countries in Latin America and South East Asia. Hence, such findings cannot holistically be used to judge the performance and contribution of EPZs to the Kenyan economy. Therefore, this implies that lack of a real body of knowledge will in the long run set serious limitations on planning and the further development and realization of the potential of EPZs in Kenya. It is for these reasons and the importance of EPZs as an industrial development

strategy that the understanding and analysis of their role in industrial development in Kenya becomes important.

Such a study will be very useful especially at this time when Kenya is in urgent need to re-orient her economy to the external markets. Thus, the findings from this study will assist Kenya in assessing the success of EPZs. It will also assist in determining the main policy and structural problems that need to be addressed in order to make the EPZ a viable industrial development strategy. This study therefore, attempts to contribute partly towards the building of a body of knowledge on the contribution, potential and prospects of EPZs in the Kenyan economy.

1.5 Scope and Limitations

Ideally this study should have examined all the EPZs in Kenya, but due to the limited time and financial resources, it was not possible. Only four EPZs located in Nairobi and Athi River were selected for a detailed analysis. The four selected EPZs were representative since they accounted for more than three-quarters of all the EPZ firms in Kenya (EPZA, 2000). For instance, out of the thirty firms located and operating in the EPZs twenty-five were located in the four EPZs in Nairobi and Athi River. This study was further confined to the operational and structural characteristics of all the firms located in the four EPZs.

In the process of undertaking this study, several problems were encountered in the field. Key amongst them was the unavailability of adequate data on EPZs since it is a new phenomenon in Kenya, continuous mobility of EPZ firms into and out of the zones and some uncooperative EPZ firm managers. However, due to numerous visits to the EPZs and follow-ups it was possible to gather enough data to achieve the objectives of this study.

1.6 Definition of Terms

Export Processing Zones are industrial spaces where manufacturing and service firms are attracted by special incentives to produce goods and services for export.

New industrial spaces are new production spaces that have come up due to the transition from one mode of industrial production (e.g. ISI to EoI) to another and with certain operational and structural characteristics.

Fordism is a mode of industrial production that involves the mass manufacturing of consumer goods on an assembly line.

Backward linkages are the interconnections of a firm to other firms from which it purchases its inputs.

Forward linkages are the interconnections of a firm with those ones that it supplies or sells its output.

Structural characteristics are aspects that determine the structure and nature of the EPZ firms such as type of technology, products and services, nature of ownership, type of raw materials, sources of inputs, labor requirements and markets.

Firm is a unit of ownership where processing and fabrication takes place.

Survival strategies are procedures put in place by EPZ firms in order to penetrate and remain competitive on the world market. These include among others: production of quality goods; meeting supply deadlines; sub-contracting; use of youthful cheap non-unionized labor; setting production targets; advertisement and locational mobility.

Labor characteristics are attributes that describe the nature and type of labor force in the EPZs such as sex, age, skills, nature of engagement (casual or permanent), criteria of payment, nature of work and workers' benefits.

1.7 Review of the Literature

Structural and operational characteristics of the EPZs have attracted considerable attention worldwide (Frank, 1981; UNCTAD, 1985; Warr, 1989; South, 1990; Rhee *et al*, 1990; Grunwald, 1991; The World Bank, 1992; Chandra, 1998). The general findings from these studies indicate that the EPZ firms are characterized by a non-complex production structure where the major production activities can be broken down into three major categories: assembly-type operations (electronics and light machinery), garment manufacturing (apparel, shoes and baseballs) and resource-based industries (precious stones, tobacco, cigars). Such activities have in common a low-level of technology and high labor content because of the difficulty of mechanizing their production processes. The most common activities in these zones are labor-intensive assembly operations and simple processing. These studies further indicate that EPZ firms are spatially mobile because a large proportion of firms in the EPZs relatively engage in simple operations that are highly dependent on cheap labor and do not require massive investments in capital goods. According to Warr (1989), these firms exploit the international

mobility of capital goods combined with domestic labor (relatively immobile internationally) in the production of goods for export. In most cases, the firm tries to move its capital equipment to countries or regions where it can earn the highest rate of return. Furthermore, these firms are mostly foreign and enjoy favored treatment with respect to imports of intermediate goods, taxation and infrastructure.

A number of studies (Frank, 1981; UNCTAD, 1985; Warr, 1989; South, 1990; Rhee *et al*, 1990; Grunwald, 1991; World Bank, 1992; Chandra, 1998) indicate that the structural characteristics of EPZ firms change with the age and duration of existence. For example at the initial stages of EPZ development, simple products and over-reliance on labor-intensive technology is predominant. However, the product mix and technology changes as the EPZ matures. For instance, garment manufacturing firms are traditionally the ones to be established in an EPZ given their minimal requirements for initial labor skills, capital and infrastructure. However, as the zone matures, the industry mix normally shifts from sewing operations to high technology capital-intensive operations. In Taiwan for instance, rising wage rates have largely displaced apparel and garment firms in the country's zones in favor of firms that require more skilled personnel that can better justify higher wages (World Bank, 1992). This situation is evidently reflected in the drop of sewing operation workers from 35 percent to only 16 percent in Taiwanese Zones (Warr, 1989; Grunwald, 1991; World Bank, 1992). Similarly in Mexico, the sewing firms have dropped from 30 to 10 percent of all EPZ firms in the past 30 years (South, 1990; The World Bank, 1992; Sander, 1998).

According to South (1990), EPZ firms are characterized by 'mature' products, which are distinguished by little technological change, standardized production processes, product competition and saturated markets. Examples of mature products manufactured by EPZ firms are: cast iron air compressors, lighting ballast, magnetic tape heads, the 'stuffing' of circuit boards and apparel. Based on the size of firms located in EPZs, there is a high incidence of small and medium enterprises (SMEs) in these zones (Warr, 1989; South, 1990; Grunwald, 1991; Sander, 1998). The reason as to why the EPZs are dominated by SMEs is explained by the fact that EPZ firms engage in simple assembly operations; hence there are no massive investments in terms of capital equipment. Furthermore, since these firms would wish to maintain their spatial mobility their investments are normally very minimal.

Studies on the anticipated benefits of EPZs to the host economy have always focused on the purchase of raw materials from the local suppliers, employment creation, technology transfer,

attraction of FDI and foreign exchange earnings as the major indicators of success. Several studies (UNCTAD, 1985; Warr, 1989; South, 1990; Rhee *et al*, 1990; Grunwald, 1991; Sander, 1998) have attempted an assessment of the contributions of EPZ firms on the host economies. The findings from these studies show that contrary to the expectations of the host economies; backward linkages in terms of purchase of raw materials and inputs from local firms have not generally been created. The main obstacles that hinder EPZ firms from buying raw materials from local suppliers is basically due to the latter's low quality and unreliability in the supply of inputs. Furthermore, since EPZ firms are exempted from paying customs duties on all imported inputs there is a bias towards imported inputs. Some studies (Frank, 1981; UNCTAD, 1985; Warr, 1989; South, 1990; Rhee *et al*, 1990; Grunwald, 1991; Sander, 1998) further indicate that since EPZ firms wish to preserve international mobility of their processing and assembly operations, developing long-term relations with the local suppliers would not serve this goal.

According to Sander (1998) the poor development of material linkages between the EPZ firms and the domestic suppliers has been hampered by failure of host countries to integrate the EPZ firms into their economies. For example, countries such as Korea, Taiwan, Singapore and Hong Kong which quickly integrated EPZ firms into their economies managed to develop very strong material linkages between the two sectors whereby local firms were able to supply EPZ firms with most components previously imported from external sources. The reason for this development was basically due to the fact that EPZ firms were integrated in to the host economy. However, in Mexico where the EPZs remained essentially as foreign enclaves isolated from the rest of the economy both forward and backward linkages were not very strong (Grunwald, 1991; Sander, 1998).

Transfer of technological and managerial skills from EPZs to the local economy is seen as a very important indicator of linkages. According to the World Bank (1992), the general trend is that the transfer of product and process technology through EPZs has been very small, except perhaps in simple industries such as garments and apparel. However, some EPZ firms may transfer technology and technological assistance to local suppliers as they develop backward linkages. Often, to guarantee quality, technological instructions are transferred from the EPZ firm to the domestic supplier (Cho, 1990). They are important tools in the development of managerial, technical and marketing know-how (Warr, 1989; South 1990; The World Bank, 1992; Johannson, 1994; Sander, 1998; Chabari, 2000). This is through on-the-job training of unskilled and semi-skilled workers previously not oriented to industrial and commercial activities. However, since most EPZ firms are based on standardized production processes, the

assembly tasks are normally separated. This separation of tasks does not expose workers to all the assembly processes hence; they are unable to produce a complete product on their own. In most cases workers are engaged in 'piece-work' production, which denies them the skills of producing a complete product (Warr, 1989; South, 1990; World Bank, 1992; Johannson, 1994; Sander, 1998). According to Chabari (2000), transfer of technology by EPZ firms in Kenya has been hampered by several factors, amongst them the reluctance of investors to get involved with the local firms, low education standards of workers hired and the spatial mobility of EPZ firms and the workers.

Employment creation is also viewed as an aspect of the linkages between EPZ firms and the host economy. EPZ firms are generally expected to create employment opportunities for the domestic population. Although, the establishment of EPZs in developing countries has contributed to employment creation, it has not been very significant (UNCTAD, 1985; Warr, 1989; South, 1990; Rhee et al, 1990; World Bank, 1992; Chandra, 1992; Kaplinsiky, 1993; Lamusse, 1994; Sander, 1998; Chabari, 2000). According to Mireri (2000) and Chabari (2000), employment creation by EPZ firms in Kenya has not been very significant because of high turnover rates in the firms, continuous closures of firms, and hiring of casual labor, which is easily laid off when the work decreases. Mireri (2000) and Chabari (2000) further show that employment creation in the Kenyan EPZs is very low due to the small numbers of people employed and the number is likely to go down with the maturity of firms and introduction of capital-intensive technologies. However, in certain regions the impact of EPZs on the surrounding labor market has been dramatic, reducing unemployment sharply not only through direct creation of jobs, but also indirectly through demand of services (UNCTAD, 1985; Warr, 1989; South, 1990; Rhee et al, 1990; The World Bank, 1992; Sander, 1998). Furthermore, the labor-intensiveness of the EPZ firms is a major contribution of employment creation in the developing countries with EPZs.

In order to remain competitive in the world market, export-manufacturing firms have had to put in place certain survival strategies (Frank, 1981; South, 1990; Sander, 1998). Several studies (Frank, 1981; UNCTAD, 1985; Warr, 1989; South, 1990; Rhee et al, 1990; Grunwald, 1991; Kaplinsky, 1993; Lamusse, 1994; Johannson, 1994; Sander, 1998) indicate that EPZ firms utilize certain strategies to remain competitive in the world market economy. According to these studies, a major survival strategy is embodied in the search for regions not affected by quota restrictions and with abundant youthful and cheap non-unionized labor. For instance, the quota restrictions imposed by major importing countries under the Multi-Fiber Arrangement (MFA) (1974), are major obstacles to garment producers. Under the MFA, quotas are set to govern the

quantity of garment products from major producing countries to be sold on the world market. In order to survive garment-manufacturing firms are forced to seek new locations. Consequently, it has set manufacturers from Hong Kong and South Korea, the major producers of garments, searching for regions with high quotas and low production levels (Knox and Agnew, 1989). For example, Hong Kong is allocated only a 0.6 percent annual increase in its shirts exports to the European Economic Commission (EEC), while Sri Lanka is allowed 7 percent (Knox and Agnew, 1989). Therefore, garment-manufacturing firms in countries with lower quotas have opted to move to those countries with higher quotas. Production of quality goods by EPZ firms is believed to be a very crucial strategy in enhancing their competitiveness on the world market. This strategy is embodied in the EPZs firms' search of reliable and high quality inputs (Warr, 1989; South, 1990; Grunwald, 1991; The World Bank, 1992; Sander, 1998). These firms are very strict on the type of inputs they use, because entire shipments of finished goods may be rejected if the raw materials and intermediate goods are of inferior quality (Warr, 1989; South, 1990; Sander, 1998).

Several studies (UNCTAD, 1985; Warr, 1989; South, 1990; Chandra, 1992; Killick, 1996) indicate that EPZ firms prefer a non-unionized, low waged and youthful labor force in many cases mostly women. Furthermore, prospective female EPZ employees are often required to undergo a pregnancy test so that the employers can avoid paying maternity benefits. EPZ firms are characterized by high labor turnover rates. According to Frank (1981), the high turnover rates arise from employers' systematic laying off of apprentices who fail to meet production expectations (Frank, 1981; Killick, 1996). Similarly, workers are laid off after suffering from disabling accidents at work, due to debilitating illness or when they become worn out from the pace and pressure of the work (Frank, 1981; Killick, 1996). Workers in these zones also spend an inordinate amount of unpaid time getting to and from work. This travel time is a cost to the worker and not the employer. Furthermore, due to depressed wages in these zones, workers can no longer afford motorized transport and hence are forced to walk to and from work, sometimes covering long distances (Frank, 1981; Killick, 1996).

The literature review has been an eye opener to issues such as the structural characteristics, linkages with the host economy and the survival strategies of the EPZ firms. These studies are very important since they contribute to the understanding of the structural characteristics of EPZ firms worldwide. They provide knowledge on how EPZ firms evolve from simple operations dependent on simple machinery and labor intensive to high-technology operations dependent on capital-intensive technologies. These studies are also very important in that they indicate the

types of linkages likely to develop between the EPZs and the host economy. These studies further provide an insight into the survival strategies utilized by the EPZ firms in a competitive world market economy. However, although the reviewed studies shed some light on the structural characteristics and linkage capabilities of EPZ firms, they have been confined to the Latin American and South East Asian economies, which have had a long-term experience with the EPZs and cannot be compared to countries like Kenya, which has recently initiated these zones as a strategy to re-orient her economy externally. Furthermore, based on the socio-economic and political diversities between Kenya and the economies of South East Asia and Latin America, the nature and characteristics of these zones may not necessarily be similar, hence the need for an empirical study.

In Kenya, studies on the EPZs are relatively few largely due to the fact that it is a new phenomenon in the country. However, this trend is now changing with several scholars trying to assess the contributions of EPZs on the Kenyan economy. For instance, Chabari (2000) examines the political and economic dimensions of EPZs in Kenya, focusing on benefits and problems that have arisen from EPZ programmes. The study examines the political and economic issues related to the ownership of firms in the EPZs, the magnitude of the repatriation of profits as well as the extent of the linkages of EPZs with the rest of the economy and the extent to which they have generated employment opportunities. The study also explores the impact of the EPZs in the country's industrialization process. Therefore, although the study provides some insight on the contribution of EPZs to the economy, it lacks the spatial orientation and falls short of the structural and operational characteristics of EPZ firms, which this study attempts to address. Mugambi (1997) looks at employment creation and skill transfer capabilities of EPZ firms with the host economy. The findings from this study indicate that EPZ firms have had some positive contribution in terms of job creation but at a very low rate. Mugambi's study has contributed some knowledge on the benefits of EPZs to the host economy but it lacks a geographical orientation. Malii (1998) on the other hand, assessed the structural and locational characteristics narrowing only on the firms located in Athi River EPZ. Hence, the findings from Malii (1998) are very narrow and are confined to the Athi River EPZ, which this study attempts to go further by assessing the structural and operational characteristics in four EPZs in Kenya. Mireri (2000) on the other hand, sought to examine the prospects of industrial development in Kenya with emphasis to the theories, policies and strategies put in place to realize the goal. The study focused on Kenya's past economic performance and a comparative analysis of the EPZ firms and the domestic firms in terms of their linkage capabilities. However, although Mireri (2000) attempted an analysis of the performance of EPZ firms in Kenya, the

study did not assess the survival strategies of EPZ firms that the present study attempts to analyze.

1.8 Theoretical Framework

The regulation approach is utilized in this study in understanding the EPZs as *new industrial spaces* in Kenya. It is a general critical social theory that views capitalist accumulation as a multi-layered phenomenon that is continuously changing overtime. According to the approach, each mode of production is governed by specific institutional and structural frameworks aimed at sustaining its operation. This approach was developed in France in the 1970s by French Marxists in an attempt to understand the inherent contradictory nature of capitalism envisaged in crises and change. The attention of this approach is directed towards understanding how capitalism reacts during periods of crises. This approach views capitalism in a sequence of historical constructs formed through the economic and social dynamics of the crisis (Aglietta, 1979; Lipietz, 1986; Nielsen, 1991; Jessop, 1992).

The fundamental elements of this approach are envisaged in the regulation mechanisms and the transition from one such mechanism to the other. Associated with these are the *regimes of accumulation* and *modes of social regulation* (Lipietz, 1986; Scott, 1988; Boyer, 1989; Jessop, 1992; Scott and Storper, 1992). A regime of accumulation is a historic specific mode of production in capitalism through which surplus is generated, appropriated and re-deployed. These regimes of accumulation are susceptible to invasion by distortions and disequilibria that threaten their sustainability. Economic recession, class conflicts and formation of monopolies between labor power, trade imbalances and environmental problems continuously affect them. Thus, the ability of any regime of accumulation to survive such pressure is therefore, dependent on the creation of certain institutional and regulatory frameworks. These are basically to preserve it from catastrophic internal collisions and breakdowns (Scott and Storper, 1992). These institutional and regulatory frameworks constitute a mode of social regulation. They are formal structures of governance and stabilization put into place to govern the mode of production at a particular period (Jessop, 1992; Scott and Storper, 1992).

The regulation approach has been applied in the industrialized world in explaining the restructuring efforts of the 1970s and the resultant *new industrial spaces*. The regimes under analysis are fordism and post-fordism. Fordism is depicted as a regime of accumulation that began just after the turn of the twentieth century and was dominant from the 1940s up to the early 1970s. While post-fordism has been described as a regime of accumulation, which came

into existence as a result of the crises that had befallen fordism (Scott, 1988; Jessop, 1992; Scott and Storper 1992). According to Scott and Storper (1992), when a regime of accumulation is faced with a crisis, the modes of social regulation can no longer absorb the tensions creating the crises without significant restructuring. For instance, the crisis of fordism which manifested itself in the prolonged drop in profitability, rising unemployment, weakening of organized labor and congestion of firms in the core-mass production centres, accentuated restructuring of production spaces (Scott and Storper, 1992). This process was characterized by relocation of firms from the industrial heartlands of North America and Western Europe to a series of *new industrial spaces* largely (but not exclusively) in the Sunbelt in the U.S.A. and Third Italy in Italy (Piore and Sabel, 1984; Scott, 1988; Scott and Storper, 1992). Thus, according to the regulation approach each shift of a regime of accumulation opens the possibilities of a switch from one set of production regions to another.

This approach further looks at the operational and structural characteristics of the resultant *new industrial spaces*. The following types of ensembles characterize these production spaces: revivified craft and design intensive industries; various kinds of technology intensive industries and producer service industries (Scott and Storper, 1992). These ensembles are characterized by the growth of small and medium firms, craft-based and flexible specialization that are heavily reliant upon, close interaction and collaboration between firms (Milne, 1990; 1991; Scott and Storper, 1992). Relocation of certain production processes away from the industrialized world to the developing countries is designated as an aspect of *peripheral fordism* (Lipietz, 1982). Peripheral fordism is a shift of unskilled industrial jobs to the cheaper wage-zones of the Third World, and the retention of skilled jobs in the developed countries. It is guided by the logic of the developed countries' search for cheaper wage zones and markets for their products. This was done through the import substitution and export oriented industrialization, which was adopted by many developing countries. According to Lipietz (1987), this led to emergence of several newly industrializing countries: four in Asia (South Korea, Taiwan, Hong Kong and Singapore), and two in Latin America (Brazil and Mexico), benefiting from the relocation of certain production sectors from the center (industrialized countries such as USA, Japan and Western Europe) to the cheap wage-zones (Frobel, 1976; Frank, 1981; Lipietz, 1982).

Lipietz (1982) has utilized the regulation approach in the explanation of the modes of production and their related industrial spaces in the developing countries. These modes of industrial production are ISIS, which was used in boosting the local production of consumer goods previously imported, and the EoI involving the manufacture of goods for export. It is within the

export oriented mode of industrial production that the concept of peripheral fordism is brought to the fore (Lipietz, 1982; 1987). The adoption of the export oriented strategy as a mode of industrial production in Latin America and South East Asia contributed very much to the process of peripheral fordism. This involved the relocation of labor-intensive assembly operations from Japan, North America and Western Europe to the developing countries where some of these assembly operations were located in EPZs (Lipietz, 1982; 1987; South, 1990; Grunwald, 1991).

The regulation approach is important because it allows an examination of the internal structure of a country, where for example it can be utilized in the analysis of economic transformations of a country in times of crises. Although the regulation approach has widely been used in the understanding of the dynamics of capitalist accumulation, it has been criticized on several grounds. First and foremost, the regulation approach treats the two regimes of accumulation (fordism and post-fordism) as clearly distinct from each other. Massey (1988) suggests that the regulation theorists do not show how important fordism was or how its dominance was established. While in reality, the two regimes of accumulation co-exist simultaneously. Secondly, it is very difficult to determine the break from one mode of production to another as the regulation approach attempts to posit. The two production spaces and their related production processes cannot be seen separately. For example, the standardized mass production characteristic of fordist mode of industrial production has continued together with the craft-based production processes characteristic of post-fordist mode of industrial production.

Despite the criticisms that have been leveled at the regulation approach, it still remains the most appropriate for this study. The regulation approach is appropriate for this study because the analysis is focused on how the transition from one mode of production to another has led to the establishment of EPZs in Kenya. This approach is utilized in this study to understand the changes in the modes of industrial production and the resultant industrial spaces in Kenya. Therefore, the task here is to understand the evolution of EPZs in Kenya and the resultant institutional and regulatory frameworks under which they function. For instance, the development of EPZs in Kenya is based on the transition from ISI to EoI modes of industrial production (R.o.K, 1986; Nyong'o, 1988; McCormick, 1995; Ita, 1995). However, since this approach seems to be limited in the analysis of aspects such as the nature of products and operations in the EPZs the *product cycle model* is incorporated. The *product cycle model* is utilized in examining the type of products and technology utilized by EPZ firms in Kenya.

The *product cycle model* envisages a set of parallel evolutionary paths along which the product technology, nature of products and production processes can be understood. For instance, the product cycle is divided into three levels through which a product evolves. The initial phase of the product is characterized by a lot of research and development (R&D) coupled with numerous technological changes aimed at enhancing the quality of the product. This particular phase of product development is normally undertaken in the industrialized countries because of its dependency on sophisticated machinery and qualified technicians. The second level of the product development entails perfection and modifications, which is also undertaken in the industrialized countries with qualified manpower. While the mature or late phases of the product cycle are characterized by little technological change therefore making the production process mechanized and standardized, hence it can be relocated to the developing countries with an abundant labor force (Dicken, 1986; Schoenberger, 1994).

It is on this basis that South (1990) utilized the product cycle model in analyzing the nature and types of products manufactured in the Mexican EPZs. The major reason for utilizing this model being basically to determine types of operations relocated from the U.S. to the Mexican EPZs. The findings indicate that the applicability of the model in the analysis of assembly plant locational change is valid. The study further shows that firms located in the Mexican EPZs are U.S. branch plants that have relocated to low-wage regions in an attempt to remain competitive on the world market.

Therefore, the *product cycle model* is utilized in this study to determine the nature of products and the types of firms located in the EPZs in Kenya. However, *the product cycle model* may not be relevant today because leading multinationals have developed global networks, and innovations may not necessarily originate from the centre (Dicken, 1986; Schoenberger, 1994). Similarly, at the intranational scale the concept seems to apply best to interpreting the behavior of firms as they expand spatially and is not as relevant to understanding the behavior of firms, which have already established national manufacturing systems. The model is also not helpful for interpreting the major flow of international investments between advanced industrialized countries (Schoenberger, 1994). Moreover, nothing is said about the rate at which the sequence operates, or when transition between one phase and the next will occur (Dicken, 1986; Schoenberger, 1994). This model is important to the present study in determining the type of products and technology utilized in EPZ firms. The model also explains why certain products can easily be produced in EPZs.

FIGURE 1.1: CHANGE IN MODES OF INDUSTRIAL PRODUCTION AND THE RISE OF EPZs IN KENYA

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┌─────────────────────┐     ┌──────────┐     ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
│ Import Substitution │────▶│  CRISES  │────▶  • Decline in industrial
│ Industrialization   │     │          │        investment /output
└─────────────────────┘     └──────────┘      • Poor export performance
                                               • Weak job creating
                                                 capabilities
                                              └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
                                                         │
                                                         ▼
                                          ┌──────────────────────────────┐
                                          │ Export oriented industrialization │
                                          └──────────────────────────────┘
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AIMS/GOALS
Externalize manufacturing Sector
Attract foreign & local investors
Employment creation

REGULARIZATION OF THE ECONOMY
- Elimination of import licensing
- Elimination of export restriction
- Reduction of tariff levels

- Manufacture Under Bond Scheme
- Export Compensation Scheme
- Import Duty/Value Added Tax Exemption Scheme
- Export Processing Zones

EXPORT PROCESSING ZONES

FIRMS/ESTABLISHMENTS

STRUCTURAL CHARACTERISTICS
- Ownership
- Technology used
- Products
- Inputs/raw materials
- Labor requirements

LINKAGES WITH THE HOST ECONOMY
- Sub-contracting
- Material linkages
- Producer services
- Employment
- Technology transfer

SURVIVAL STRATEGIES
- Quality products
- Technology-upgrading
- International mobility
- Use of cheap non-unionized labor
- Advertisement

LABOR CHARACTERISTICS
- Long hours
- Low salary
- Tiring work
- Dangerous Work
- Use of youthful non-unionized labor
- Predominantly female workers

Source: Adapted from Aglietta (1979), Lipietz (1986), Boyer (1989) and Jessop (1992)

1.9 Conceptual Framework

The model (Figure1) shows the evolutionary path between institutional and regulatory frameworks through which the EPZs have evolved in Kenya. The focus is on the transition from ISI to EoI. Due to the crises that befell the ISI strategy in the early 1980s, the EoI strategy was adopted in Kenya in an attempt to re-orient industrial production externally. In order for this

strategy to realize its objectives, the economy was regularized through elimination of import licensing and export restrictions coupled with reduction in tariff levels.

It is within this framework that instruments such as manufacture under bond (MUB), export compensation scheme, import duty exemption scheme and the Export Processing Zones (EPZs) were initiated in Kenya. In understanding EPZs as new industrial spaces in Kenya, emphasis is placed on aspects such as structural attributes, linkages, marketing strategies and nature and dynamics of labor of the firms located in the EPZs. The enclave approach (Figure 4.1) is also utilized in this study as a descriptive tool in assessing the linkage capabilities between the EPZs and the host economy. Corden (1974) developed this approach in an attempt to utilize measuring the welfare benefits between the EPZs and the host economy. According to this approach, EPZs are viewed as enclaves within a host economy with the capability of backward and forward linkages. Thus this approach is utilized in this study to assess the linkage capabilities of EPZs and the host economy.

1.10 The Study Area

This study was confined to the EPZs in the city of Nairobi and Athi River town in Kenya (Map 1). Nairobi is the smallest province in Kenya and covers a total area of 629 Km^2. It is located on the Western section of the Athi Kapiti plains and at the foot of the Kikuyu highlands about 140 Kms South of the Equator, and it lies 1°19' South of the Equator and 36°59' East of the Prime Meridian. Nairobi is the capital city of Kenya and plays a principal role as the political, industrial and commercial centre. It has the majority of manufacturing industries in Kenya, both in terms of the number of industrial establishments and the total value of industrial output (Ogendo, 1972; Obudho and Aduwo, 1992). The core of the industrial land use in Nairobi is located within the Industrial Area, which lies in the Southeast corner of the city. Other industrial land use locations are in Ruaraka and Dandora. Rafiki EPZ, Thomas De La Rue EPZ and Sameer Industrial Park were the study areas in Nairobi city (Map 1).

Athi River town on the other hand is located in Athi River Division of Machakos District in the Eastern Province of Kenya. The town is situated at the junction of Nairobi-Mombasa highway and the Great North road (Namanga road). Athi River town and its environs support one of Kenya's most dynamic economic sectors like horticulture and manufacturing. Athi River is a very important industrial satellite town of Nairobi because it serves Nairobi city with the following purposes: decentralization of industries from the already congested industrial area and as a catchment area for workers.
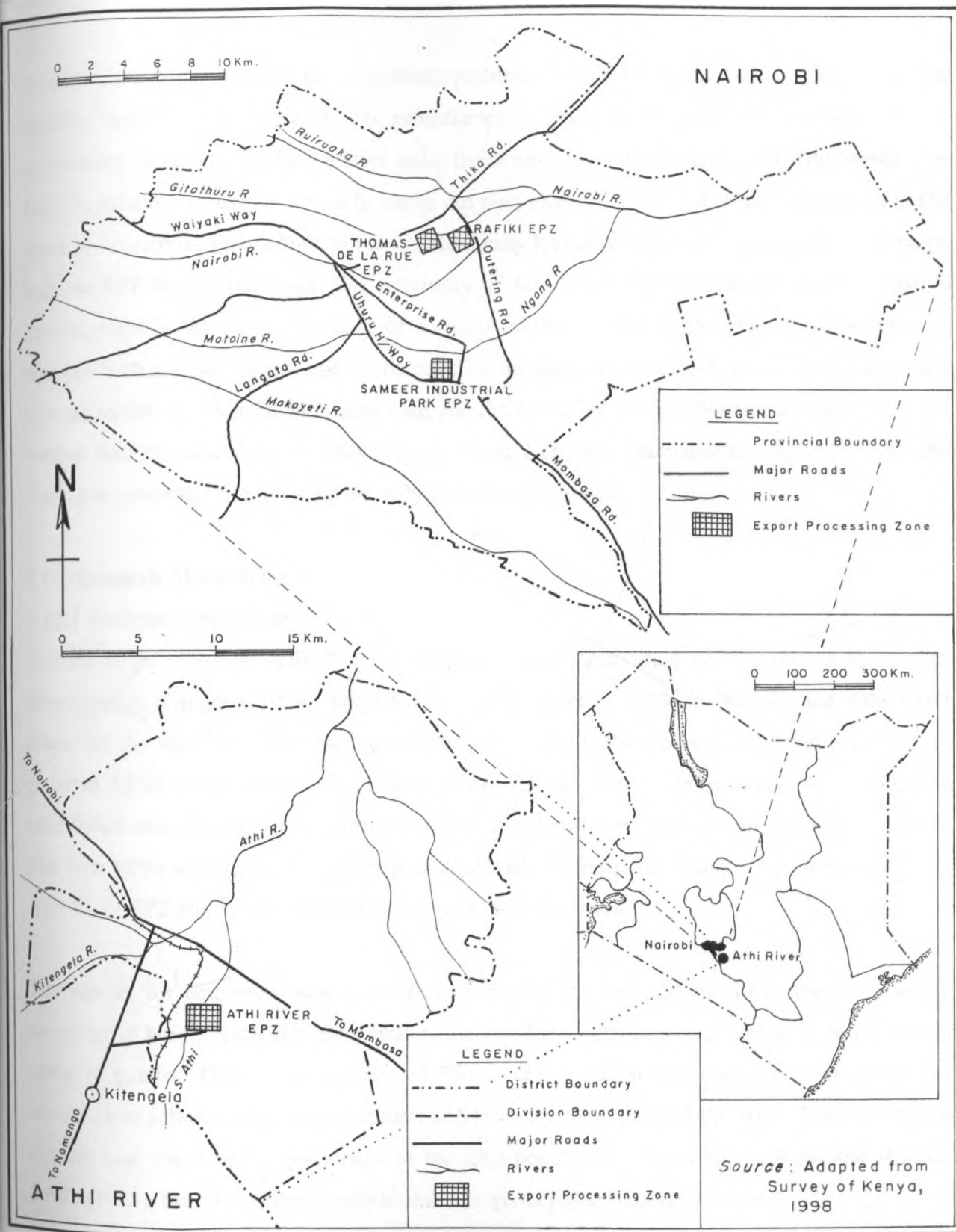
Map 1   Location of Export Processing Zones in Nairobi and Athi River

According to Mireri (1992), the congestion problem in Nairobi's industrial area has forced the rapidly expanding firms to set up subsidiaries in Athi River town. Furthermore, due to availability of cheap land, some steel mills firms have been attracted to Athi River town. The land in Athi River town is not only cheap but also ideally flat for industrial development. The town is situated on a plain land, which makes it easy for construction of large industrial premises such as EPZ factory buildings. The proximity of Athi River town to Nairobi fosters industrial development in the former because of reduced transport costs to the market outlets through Nairobi with a major airport that serves most of the destinations. The town is also strategically located astride the Nairobi-Mombasa road and the Great North road (Namanga road). The town further has the advantage of proximity to Jomo Kenyatta International Airport (JKIA) and Embakasi container depot, which are only 20 kilometers away.

1.11 Research Methodology

1.11.1 Sampling Procedure

The universe, which is defined as an aggregate of all individual objects related to a given phenomenon (Gregory, 1978), consisted of all the gazetted EPZs in Nairobi and Athi River town. At the time this study was conducted (1999-2000) there was a total number of seven gazetted EPZs in the study area (EPZA, 2000). All the four EPZs in which firms had been established and already manufacturing products for export were selected for a detailed analysis. The four EPZs selected were Sameer Industrial Park, Rafiki EPZ, Thomas De La Rue EPZ and Athi River EPZ and all the 25 firms operating within the zones.

The sample for employees was selected from all the 25 firms, by use of a stratified random sampling technique such that each stratum reflected the heterogeneous nature of employees in terms of gender. Thus, a sample size of 250 workers, which comprised of 95 men and 155 women, was selected from the population of 5450 workers in the 25 EPZ firms. The size of each stratum was calculated in proportion to the total population. According to Bless and Higson-Smith (1995), the ratio of the sample to that of a given population is as follows:

$$f = \frac{n}{N}$$

Where: f = the ratio of the sample to that of the population

        n= size of the sample

        N = size of the population

In this study, f is equivalent to 250/5450, which is equal to 0.0458715. Therefore, each category of the population is multiplied by f (0.0458715) to obtain the corresponding category of the sample. For instance to get the total sample of men and women from the 25 firms, (0.0458715) was multiplied by the total number of men (2071) and women (3379) to get a sample size of (95) and (155) respectively. The same proportion (0.0458715) was used in calculating the number of men and women sampled from each firm.

A stratified random sampling technique was necessary to ensure adequate coverage of the employees who could have been ignored through mere random sampling. It reduces the likelihood of attaining an unrepresentative sample (Barber, 1988; Bless and Higson-Smith, 1995). After obtaining the sub-samples from each firm, simple random sampling technique was employed in drawing individuals for interviews. According to Hosking and Clark (1986), random sampling allows each element in the population to have a chance of being sampled.

1.11.2 Data Collection

Various tools were employed in the collection of data. Primary data was obtained from the field by use of structured questionnaires. A structured questionnaire is a set of standardized questions, which guide the respondents in such a way that there exists no freedom to make adjustments in the content (Schoenberger, 1991). The advantages of standardized questionnaires are that they offer the possibility of formal hypothesis testing with a high degree of statistical generalizability and confidence. The method ensures replicability, consistency and thus, reliability of data. The semi-structured questions were incorporated in this study for the purpose of probing firm managers on critical issues such as survival strategies and working conditions in the firms. Primary data was collected from the EPZ firm managers, employees in the EPZ firms, EPZ managers, and officials from the EPZA, IPC and EPC, while secondary data was obtained from EPZA newsletters, brochures, seminar papers and reports, government of Kenya and international publications.

1.11.3 Data Analysis and presentation

This study employed both descriptive and inferential statistics in analyzing the field data. Descriptive statistics were utilized in summarizing and displaying the raw data in order to determine its reliability and consistency. For the first two hypotheses descriptive statistics such as means, frequencies, and percentages were employed. These statistics were used in determining whether there were significant differences in the structural characteristics within EPZs or not. Descriptive statistics were further used in determining whether EPZs have linkages

with the host economy or not. The enclave approach was also used as a descriptive tool in explaining linkage patterns between EPZs and the host economy. In determining whether levels of capital investment by each EPZ firm have a direct effect on the number of workers employed and vice versa cross-tabulations were employed.

For hypothesis three, factor analysis employing the principal component technique was used to identify the most significant strategies utilized by EPZ firms in a competitive world market economy. This technique was used to reduce the original set of explanatory variables to a few independent variables without any significant loss of information.

2. EVOLUTION OF *'NEW INDUSTRIAL SPACES'* IN KENYA.

2.0 Introduction

Export Processing Zones (EPZs) are new production spaces that have come about In Kenya due to the industrial restructuring and liberalization of the economy. Industrial restructuring in Kenya involved the transition from Import Substitution Industrialization (ISI) to Export oriented Industrialization (EoI) modes of production and their related regulatory frameworks (R.o.K, 1986; Nyong'o, 1988; McCormick, 1995). While the concept new industrial spaces refers to the new production spaces the came about due to the transition in the modes of industrial production from fordism to post-fordism (Piore and Sabel, 1984; Scott, 1988; Scott and Storper, 1992).

This chapter focuses on the mechanisms and processes that have triggered the change from one mode of industrial production to another and the resultant production spaces. The task here is to determine whether EPZs can be described as *new industrial spaces* in Kenya. This is accomplished by focusing on the evolutionary process and structural characteristics of the concept *new industrial spaces* in the industrialized countries in relation to EPZs in Kenya. To understand the transition process well, both modes of industrial production in the industrialized world (fordism and post-fordism) and in Kenya (ISI and EoI) are examined.

2.1 Fordism to Post Fordism

The history of capitalist accumulation according to the regulation approach can be understood in terms of transition from one mode of accumulation to another (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). The modes of accumulation under analysis are fordism and post-fordism. According to Scott and Storper (1992), fordism is a mode of accumulation based on the principles of an assembly line. Henry Ford (1863–1947) whom fordism as a mode of production is named after founded the Ford Motor Company in 1903 (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). Henry Ford wanted to produce a reliable form of transportation that the average consumer could afford. He relied on economies of scale to expand the market once the basic product design had been fixed. The assembly line permitted levels of standardization and continuous utilization of capacity. In 1908 the company initiated the production of the model-T automobile based on the fordist mode of production. Thus, fordism involves the mass production of consumer durables manufactured on the moving assembly line techniques operated with the semi-skilled labor of the mass worker (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). Therefore, based on Henry Ford's invention, fordism can clearly be described by the following characteristics:

- The combination of standardized parts/special-purpose machinery, the fragmentation of labor skills and the moving assembly line;

- Economies of scale reaped through large-scale mass production;

- Long runs of standardized goods linked to a system of protected national markets;

- A concentration of highly paid, semi-skilled mass workers in large factories and geographical (industrial heartlands);

- A hierarchical, bureaucratic form of work organization characterized by a centralized management system; and

- A state management of the national economy through a range of Keynesian policies, which regulated levels of income, demand and welfare (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992).

Geographically, fordism was characterized by a strongly oligopolistic structure of industry that was encouraged by large-scale markets and rising barriers of entry (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). In addition, a specifically fordist pattern of labor relations and labor markets was established by the institution of collective bargaining in virtually all major mass production industries in the USA and Western Europe. Through collective bargaining, rules governing the labor process (work rules and structures) and the labor market (wage-setting procedures, recruitment and lay-offs) were typically codified in employment contracts and laws. The relationship between capital and organized labor, for example, guaranteed labor availability and rising real wages, while provision of social security and unemployment compensation ensured that workers could continue consuming even when they were not working (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992).

Within fordism, industries tended to agglomerate in and around large industrial conurbations in North America and Western Europe (Myrdal, 1957; Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). These were regions with large and relatively affluent working classes. In the early 1950s and late 1960s, this pattern of development was theorized in regional terms as a system of core-periphery relationships. This theorization saw core industrial regions as growing at the expense of underdeveloped peripheral regions, which in turn provided raw materials or agricultural goods for the industrial regions at unfavorable terms of exchange (Myrdal, 1957).

By the late 1970s, the fordist mode of production experienced a major crisis manifested in the increasing difficulty of achieving high levels of productivity and the limits this imposed on the

ability of the system to keep wages and consumption moving upwards (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). The emergence of Japan and some of the Newly Industrializing Countries (NICs) introduced a component of competition in the world markets. There was massive restructuring as producers searched for new models of industrial organization, labor relations and location of firms. The effects of the resulting plant closures and lay-offs in the core-regions of mass production intensified the need for producers to relocate branch-plants to low cost peripheries. The nature of the demand was also changing from standardized products to specialty and luxury goods (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992).

The crisis that befell fordism in the late 1970s ushered in a new mode of production referred to as post-fordism. Post-fordism is used as a broad and abstract tool to describe the multiplicity of different changes that came into existence in the late 1970s and intensified in the 1980s and 1990s (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). According to Aglietta (1979), post-fordism represents a qualitative shift in the organization of production and consumption, as well as a break in the mode of regulation.

Post-fordism is based on flexible manufacturing systems with an ability to switch from economies of scale (mass) to economies of scope (batch) and the introduction of new ways of organizing work to improve product quality (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). According to Scott and Storper (1992), technological change in the form of sophisticated equipment characteristic of post-fordism has revitalized craft and small batch production allowing producers to cope with increased volatility and fragmentation of demand. Flexible workers and machines are replacing the dedicated equipment and workers associated with the old mass production systems.

Post-fordism relies on numerical and functional flexibility (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). Where numerical flexibility is the ability to shrink the firms' operations or expand it as times demand. The mechanisms of achieving numerical flexibility include, temporary workers, part-time workers, home working, outworking and the most important of all is subcontracting. Subcontracting is an arrangement whereby a firm sublets whole or part of the production process to an independent firm (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992; Opondo, 1997). This process further manifests itself in a parent firm establishing subsidiaries to supply it with certain raw materials and inputs. For example the Mitsubishi Motor Corporations (MMC) a manufacturer of Mitsubishi motor brands

has established subsidiaries in different countries all over the world to manufacture parts and components to be assembled onto complete products. This proce4ss requires close contact between the parent firm and the subsidiaries or the subcontracted and subcontracting firm in order to conform to specifications and production schedules (Hirst and Zeitlin, 1991; Scott and Storper, 1992).

Functional flexibility on the other hand involves broadening of job arrangements, hours of work, allocations and work structures. According to Scott and Storper (1992), flexibility is achieved through a just-in-time (JIT) manufacturing procedure. For instance, as compared to the fordist just-in-case (JIC) manufacturing system where inputs are purchased stored in advance, the principle of JIT is to control the inventory at each stage of production (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). Through the JIT manufacturing system, it is easy to upgrade, streamline the production and control the cost of production. For this manufacturing system to be successful, there is need for tremendous coordination, proper timing and considerable flexibility on the part of the workers. Therefore, production is no longer governed by the speed of the flow of the assembly line, but by the efficiency of various units of the production process. The JIT manufacturing system enables workers to operate in teams and master a wide range of skills unlike the rigid job descriptions and work rules that characterize fordism (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992).

Flexible production within post-fordism has led to rise of smaller firms with very strong linkages (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). These firms form unique agglomerations quite different from those associated with the fordist industry. This has led to the emergence of *new industrial spaces* in the developed countries in locations without any previous industrial concentration such as the Sunbelt in the US and Third Italy in Italy (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992).

2.2 The Concept of New Industrial Spaces

New industrial spaces or industrial districts are an outcome of a major industrial restructuring, which has been observed in virtually all industrialized countries since 1975 (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). The transition from fordism to post-fordism has led to the emergence of new production spaces characterized by flexible production of differentiated products as well as a change from large, hierarchical firms to networks of firms and subcontracting arrangements (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). According to Scott and Storper (1992), this involved relocation of firms from the

industrial heartlands to locations that had never had previous industrial concentration such as the US Sunbelt and Third Italy in Italy (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992).

The new industrial spaces differ from the old industrial spaces in terms of certain structural characteristics. One of the crucial characteristics of these spaces is their organization which is governed by very strong networks between small and medium firms which through specialization and sub-contracting, divide amongst themselves certain production stages (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). According to Hirst and Zeitlin (1991), specialization influences the firms' efficiency within the industrial district. The firms that form an industrial district utilize the advantages of specialization and subcontracting to enhance their survival. The strong linkages of firms in the industrial district are enhanced by their geographical proximity and this further encourages collaboration of firms in terms of business (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992).

Industrial districts are further characterized by cooperation of firms in terms of provision of services and information (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). According to Piore and Sabel (1984), the collective provision of services and information is very advantageous to small firms that lack the capacity to operate in isolation. The success of an industrial district is pegged on the production of a variety and differentiated products and not on price alone. For instance, these new industrial spaces represent some sort of organization that meets competitive challenges through differentiated high quality products, flexible modes of production and the ability of innovation. The capability of the industrial district to offer quality, variety, flexibility, speed and innovations is a kind of industrial organization based on competition and cooperation (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992).

The flexible mode of production is a characteristic most often associated with the industrial districts' advantages over large centralized and oligopolistic agglomerations (Piore and Sabel, 1984; Hirst and Zeitlin, 1991; Scott and Storper, 1992). Flexibility within the industrial district is achieved with the availability of a well-trained and adaptable workforce in a very conducive social structure and environment. Adaptability in the workforce is achieved by breaking down rigid work divisions between managers and the workforce within an atmosphere of trust. Trust is enhanced by continuous training of the workers to improve their skills and by maintaining high labor standards which includes paying workers good wages (Piore and Sabel, 1984; Hirst and

Zeitlin, 1991; Scott and Storper, 1992).

2.3 From Import Substitution to Export oriented Industrialization

2.3.1 Import Substitution Industrialization Strategy

Import Substitution Industrialization (ISI) is the type of industrialization typical of former colonies and other dependent nations of Africa, Latin America and Asia (Coughlin and Ikiara, 1988; Nyong'o, 1988). According to Bullmer-Thomas (1994), these countries specialized earlier in producing raw materials (primary commodities) for export while importing almost all their manufactured goods. In order for these countries to save on the foreign exchange previously used in importing manufactured goods and further be self-reliant, the ISI strategy was adopted. Simply put, ISI involves a conscious and state-sponsored effort to develop home based industries by substituting domestically produced goods for goods that were previously imported through the protection of domestic markets from both foreign producers and foreign products (World Bank, 1981; Coughlin and Ikiara, 1988; Nyong'o, 1988; Bullmer-Thomas, 1994; Cravey, 1998). This is accomplished through the imposition of tariffs, quantitative restrictions of imports, and other non-tariff barriers. According to Cravey (1998), ISI is also generally accompanied by various subsidies designed to encourage locally owned and controlled firms to invest in target industries. This strategy is assumed to pass through three stages (Coughlin and Ikiara, 1988; Nyong'o, 1988; Bullmer-Thomas, 1994; Cravey, 1998). The first stage being that of the local production of mass consumer goods. The second stage is that of producing intermediate goods locally. The third stage of ISI is that of developing a capital goods sector.

Once a country moves through the second phase of industrialization it is assumed that production for the domestic and export market is possible. However, the reality is that very few Third World countries ever reach the stage where production of capital goods by domestic industries is a reality (Coughlin and Ikiara, 1988; Nyong'o, 1988; Bullmer-Thomas, 1994; Cravey, 1998). The obstacles created in the first two stages make it impossible for a smooth transition to the third stage. Thus, very few Third World economies reach the third stage and in most cases those that manage to reach this stage do so as enclaves of Multinational Corporations (MNCs) (World Bank, 1981; Coughlin and Ikiara, 1988, Nyong'o, 1988; Sharpley and Lewis, 1990; Bullmer-Thomas, 1994; McCormick, 1995; Cravey, 1998).

2.3.2 Import Substitution Industrialization Strategy in Kenya

The history of Import Substitution Industrialization (ISI) in Kenya can be divided into three phases: the colonial phase, the post-independence phase and the crisis phase (Coughlin and Ikiara, 1988, Nyong'o, 1988; Swainson, 1978; Sharpley and Lewis, 1990).

The Colonial Phase

The completion of the Kenya/Uganda railway in the nineteenth century was a major catalyst for the British colonial office in encouraging white settlement in the Imperial British East Africa (IBEA) in Uganda and Kenya. The settlement by the whites in the IBEA was followed by a number of import-export houses establishing branches in Kenya as early as 1905 to supply consumer goods to the East African region. According to Swainson (1978), the major types of ISI industries that existed in Kenya before and after 1945 were those processing primary agricultural products and mainly owned and controlled by local European and foreign firms. In order to protect their colonial markets against foreign competitors, Britain imposed various types of tariffs against imported foodstuffs from the colony. These tariffs were later extended to protect all local industries in Kenya against foreign competition (Swainson, 1978; Himbara, 1980; Coughlin and Ikiara, 1988, Nyong'o, 1988).

The end of the Second World War marked another era of British expansionist policy in IBEA. Due to the heightened global competition most inefficient British capital was forced to relocate and invest behind the protective wall of tariffs in the IBEA in order to maintain and control the market (World Bank, 1981; Coughlin and Ikiara, 1988; Nyong'o, 1988; Swainson, 1978; Sharpley and Lewis, 1990). The IBEA was further threatened by the outward oriented of industrial capital in Europe and the US and the emergence of MNCs resulting in the introduction of more protective barriers by the colony (Swainson, 1978; Nyong'o, 1988).

Post-Independent Phase (1964-1980)

The years 1964 to 1974 were the successful moments of the ISI in Kenya (R.o.K, 1986; Nyong'o, 1988; Coughlin and Ikiara, 1988). According to Nyong'o (1988), the success of the ISI in Kenya was based on the imposition of protective tariff barriers on imported goods, with an exception of goods to supplement domestic production. Protection accorded to the domestic industries was further enhanced through the oligopolistic structure of firm ownership in Kenya hence limiting competition. Furthermore through the provision of a wide range of incentives firms were encouraged to manufacture entirely for domestic market (Swainson, 1978; Himbara, 1980; Nyong'o, 1988).

An examination of the trends for total GDP (Figure 2.1) reflect the significant changes in the policy framework that took place in the following periods 1964-1970; 1971-1980; 1981-1990; 1991-1995 and of late 1996 to 2000 (R.o.K, 1986; 1992; 1997; 2000; Opondo, 1997). From 1960 to 1980 Kenya enjoyed a high rate of growth. During this period, manufacturing sector experienced rapid growth and its share of gross domestic product (GDP) was constantly on the increase. It is noted that the initial reason for setting up the ISI was to provide employment facilities, bring in needed skills and technology and create a process of domestic capital formation necessary for long-term industrialization (Sharpley and Lewis, 1990; R.o.K, 1994; 1996; 1997).

Figure 2.1: Average Annual Growth Rates of Real Gross Domestic Product (1964-2001).
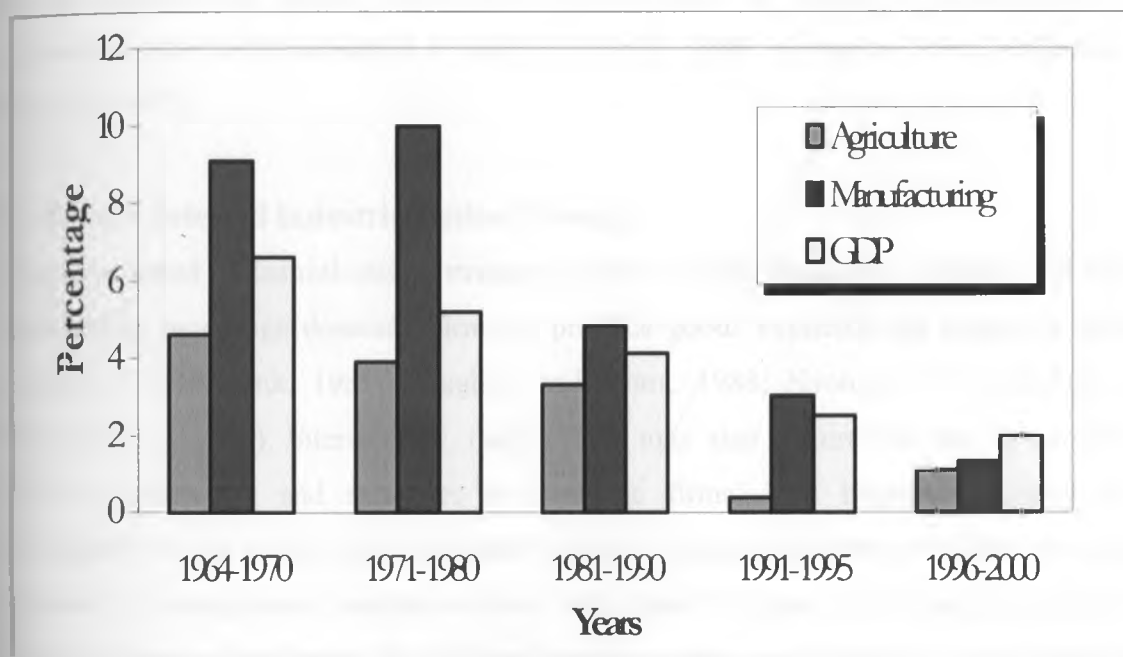
Source: Adapted from Opondo, 1997.

The Crisis Phase (1981 to the Present)

The ISI strategy led to the creation of high-cost industries because small domestic markets meant full economies of scale could not be realized with prices of products on the market also increasing because of the absence of competition both from local and foreign producers (Swainson, 1978; Himbara, 1980; Nyong'o, 1988; Sharpley and Lewis, 1990; Opondo, 1997). Industrialization policies at that particular period were directed towards protecting domestic factory producers from competing imports through tariffs or quantitative restrictions. Therefore, as foreign exchange became more and more scarce, policies were put in place in order to attract foreign direct investments (FDI) into the country. The priority given to industry implied a relative neglect of agriculture, often accentuated by worsening terms of trade for agriculture resulting from price and taxation policies. The ISI failed to reduce external dependence, since in

many instances raw materials were imported (Sharpley and Lewis, 1990; R.o.K, 1986; 1992; 1994; 1996; 1997).

The poor performance of ISI was further exacerbated by the decline in investments, lack of foreign exchange earnings, poor job creating capabilities, inefficiency in the manufacturing sector, small markets (due to the collapse of the East African common market in 1977) and pressure from the international agencies, particularly the World Bank and the International Monetary Fund (IMF) for Kenya to liberalize her economy (World Bank, 1981; Sharpley and Lewis, 1990; R.o.K, 1986; 1992; 1994; 1996; 1997). The drastic decline of the GDP (Figure 2.1) necessitated the search for an alternative set of policies and strategies in Kenya. This was guided by the restructuring efforts, which involved the need for Kenya to re-orient her industrial production externally embodied in the EoI (R.o.K, 1986; Nyong'o, 1988; McCormick, 1995; Opondo, 1997).

2.4 Export Oriented Industrialization Strategy

Export oriented Industrialization strategy is also a state sponsored strategy but one that is designed to encourage domestic firms to produce goods explicitly for export or international markets (World Bank, 1981; Coughlin and Ikiara, 1988; Nyong'o, 1988; Bullmer-Thomas, 1994; Cravey, 1998). Interestingly, this strategy may also require the state to provide various types of protection and subsidies to domestic firms. This happens because local firms particularly in the early stages of export oriented industrialization often lack the capacity to compete in international markets without help from the state. According to Bullmer-Thomas (1994), the crises that befell ISI in Latin America, Africa and South East Asia, necessitated the need for change in the industrialization strategies. The debt crises and the world oil shock of the 1980's were some of the phenomena that marked the demise of ISI in the developing countries.

As a result, there was an urgent need to shift from the Import Substitution Industrialization (ISI) to the Export oriented Industrialization (EoI). Within the EoI strategy the focus of manufacturing shifted from the domestic to the global economy since the small size of markets in the developing countries limited the potential success of ISI (Bullmer-Thomas, 1994; Cravey, 1998). The strategy was further favored and imposed through the Structural Adjustment Programs (SAPs) by multilateral agencies such as International Monetary Fund (IMF) and the World Bank (World Bank, 1981; Coughlin and Ikiara, 1988; Nyong'o, 1988; Bullmer-Thomas, 1994; Cravey, 1998).

The restructuring of the industrial regimes from the ISI to the EoI was made possible by freeing the economy, stabilizing inflation and privatizing of state owned enterprises (Bullmer-Thomas, 1994; Cravey, 1998). In Mexico for instance, the transition from ISI to EoI was marked by a geographical shift in location firms from the major industrial regions (Mexico city and Guadalajara) to the US-Mexico border regions. These locational changes are attributed the inception of the Mexican EPZs program between the 1960's and 1980'sas a major regional development policy (Bullmer-Thomas, 1994; Cravey, 1998).

2.5 Export Oriented Industrialization Strategy in Kenya

There are certain historical conditions specific to Third World countries that define the possibilities for successful industrialization strategies to be adopted. For instance, high levels of external debts, for one, require that countries increase their levels of exports in order to earn foreign exchange credits with which to service such debts and so that they may continue to purchase foreign goods such as industrial inputs. More importantly, even in the absence of high levels of debts, exportation has proven to be an important development strategy, as realized in the relative successes of several South Asian economies (Evans, 1987). Export oriented industrialization permits enlargement of the productive forces at a greater rate than would be provided by enlargement of domestic markets alone.

In the early 1980s, changes in policies towards industrialization in Kenya started to receive considerable attention (World Bank, 1981; Coughlin and Ikiara, 1988, Nyong'o, 1988; McCormick, 1995; Sharpley and Lewis, 1990; R.o.K, 1986; 1994; 1996; 1997). This was aimed at shifting away from an ISI strategy characterized by highly protected industries to a more liberal type of industrialization strategy. Thus, the government's efforts were geared towards re-orienting her economy externally where market mechanisms and private enterprises were to be fostered as major engines of growth (Sharpley and Lewis, 1990; R.o.K, 1986; 1994; 1996; 1997).

The country's current round of economic liberalization and restructuring efforts was initiated in 1988 in the context of the Industrial Sector Adjustment Program (ISAP) (R.o.K, 1986; 1988; 1990; 1997; Ita, 1995). This was aimed at restructuring Kenya's industrial sector in order to stimulate investment as well as render it more export-oriented. The first phase of the ISAP, which was implemented between 1988 and 1990, concentrated on the liberalization of trade and deregulation of the domestic economy. All this was aimed at reducing the anti-export bias of the

overall policy and regulatory framework. Thus, the reinforcement of the broader policy reform process as well as the stimulation of the export supply response was addressed through the Export Development Program (EDP) (R.o.K, 1986; 1988; 1990; 1997; Ita, 1995). The objective of the EDP strategy was to increase the quality and diversification of Kenya's exports (R.o.K, 1994; 1996; 1997; Ita, 1995).

The single most important determinant for meeting Kenya's economic aspirations is the extent to which the country can easily market its goods on the world market. In order to re-orient the economy externally, policies and strategies have been designed aimed at increasing the volume of exports and diversification of the non-traditional products (R.o.K, 1986; 1990; 1994; 1997; McCormick, 1995; Ita, 1995). In the past years Kenya has over relied on agricultural exports, which of late have been experiencing low and heavy price fluctuations. Therefore, it has been the goal of the Kenyan government to promote the manufacture of high value non-traditional products that will assure the economy of stable and rising foreign exchange earnings that it critically needs in the quest for industrial development. Thus, the export promotion schemes that have been put into place to re-orient the industry externally include Manufacture Under Bond (MUB), Export Processing Zones (EPZs), and Value Added Tax exemption. All these are aimed at stimulating export by reducing tariffs, taxes and regulations on exporting firms so that their products are better able to compete internationally. The Manufacturing Under Bond and Export Processing Zones are also intended to attract mobile capital to Kenya that might otherwise be invested elsewhere. Thus, it is under the EoI mode of production that EPZs have evolved in Kenya as *'new industrial spaces'*, aimed at re-orienting industrial production externally (R.o.K, 1986; EPZA, 1990; McCormick, 1995; Ita, 1995).

2.6 Export Processing Zones: A Historical Perspective.

EPZs are industrial zones with special incentives set up to attract investors, and in which imported and to some extent locally sourced materials undergo some degree of processing before being exported (Warr, 1989; Grunwald, 1991; WEPZA, 1997). According to Warr (1989), EPZs are some of the main components of a foreign led investment and export-oriented industrialization strategy. The earliest EPZs were established in Spain in the thirteenth century when King Alfonso X granted certain commercial privileges to the city of Cadiz. The Free Zone Consortium of Cadiz was founded in 1929. Elsewhere in Spain, a Free Zone was set up in Barcelona before the First World War but due to the civil war it did not really take off until after the Second World War when a number of automobile plants were established. Shannon in Ireland is another important zone set up as early as 1959 (Warr, 1989; Grunwald, 1991; WEPZA,

1997; ILO, 1997; World Bank, 1992). However the big boom in zone formation came in the 1970s, and has continued up to the present (Table 2.1)

Table 2.1: Distribution of EPZs by region, 1997

Region	No. of Zones	Key countries
North America	320	United States-(213), Mexico-(107)
Central America	41	Honduras-(15), Costa Rica-(9)
Caribbean	51	Dominican Republic-(35)
South America	41	Columbia-(11), Brazil-(8)
Europe	81	Bulgaria-(8), Slovenia-(8)
Middle East	39	Turkey-(11), Jordan-(7)
Asia	225	China-(124),Philippines-(35), Indonesia-(26)
Africa	47	Kenya-(14), Egypt-(6)
Pacific	2	Australia-(1), Fiji-(1)
TOTAL	845	

Source: WEPZA and ILO, 1997.

These figures are rising all the time, particularly as more countries authorize the development of EPZs. The liberalization of production and capital markets serves to reinforce this trend, as does the increased need for flexibility in production. According to WEPZA (1997), by targeting incentives at specific categories of investment, countries are encouraging integrated manufacturing using domestic as well as foreign investment in a wide variety of zone formats, including EPZs, free trade zones, industrial free zones, maquiladoras, special economic zones, bonded warehouses, technology and science parks, financial service zones, and free ports. The common element remains, however with the provision of incentives to attract foreign direct investment for export production (WEPZA, 1997; ILO, 1997; World Bank, 1992).

2.6 Export Processing Zones in Kenya.

EPZs in Kenya, like the concept, *new industrial spaces* in the industrialized countries are perceived as new production spaces based on their evolutionary and structural characteristics. This is because EPZs follow a similar trajectory in their evolutionary process whereby the move from ISI to EoI has necessitated the establishment of these zones in Kenya. For instance, the industrialization process in Kenya before and after independence and up to the late 1970s was based on the ISI, which depended on a complicated tariff system that in most cases was combined with an overvalued national currency (R.o.K, 1994; 1997; Sharpley and Lewis, 1990). High tariff rates were imposed on imports of manufactures, which were produced locally by import substitution industries. On the other hand, tariffs on inputs required by these industries were very low (R.o.K, 1986; 1994; 1997; Sharpley and Lewis, 1990). The import substitution industries were above all dependent on local demand, imported input, oligopolistic firms (highly

protected and inefficient) and governed by a very rigid regulatory framework (R.o.K, 1986; Nyong'o 1988; McCormick, 1995). Industrial production was restricted to local markets with exports confined to traditional products such as coffee and tea. Therefore, due to the impending shortcomings of ISI, there were efforts from international agencies such as the World Bank and the IMF on the change of strategy from an inward looking economic trend to an outward one (World Bank, 1981; Coughlin and Ikiara, 1988, Nyong'o, 1988; McCormick, 1995; Sharpley and Lewis, 1990; R.o.K, 1986; 1994; 1996; 1997). The advice was to move away from protection of domestic market-oriented industry and towards an export-led growth based on non-traditional products.

Therefore, Kenya adopted the EoI strategy in the early 1980s, under which the EPZs were established in 1990 in order to re-orient the industrial sector externally (R.o.K, 1986; EPZA, 1990; McCormick, 1995; Ita, 1995). The shift from ISI to EoI like the shift from fordism to post-fordism has led to the establishment of EPZs as new production spaces in Kenya. The EPZs are further referred to as new industrial spaces in Kenya based on certain structural and operational characteristics quite different from firms located outside the zones. They are indeed *new industrial spaces* in Kenya because they deviate from the traditional import substitution industries. These zones are designed to facilitate the processing and assembly of goods and services mostly for export markets. In most cases the zone authority has its own zone police force to monitor the movement of goods in and out of the zone and prevent firms in the EPZs sneaking products into the domestic economy. Firms located in the EPZs are allowed to import raw materials and other inputs tax-free. The total isolation of the zone from the rest of the country appears perhaps most clearly in the fact that the zone authorities issue special passports that both workers and visitors have to show when entering or leaving the zone.

The major objective of these zones is to provide favorable conditions for foreign capital establishing plants for export production. Within the zone a large number of incentives are used to attract international mobile capital. The legal, institutional and incentive framework for the EPZ program is underpinned in the EPZ Act of 1990. The incentives provided under the program include: a ten-year tax holiday; duty and tax free access to imports and capital equipment; relief from exchange controls; liberal conditions for repatriation of capital, interests and dividends; speedy processing of work permits for essential expatriate workers; quick investment approval process and green channel treatment as regards processing of import and export cargo documentation (EPZA, 1990; pp. 1) These incentives are aimed at reducing risks and transaction cost barriers, hence enabling easy integration of small and medium enterprises (SMEs) into the world market (South, 1990; Sander, 1998). Furthermore, these incentives enable

firms to experiment with several production options such as production sharing and outward processing.

Production sharing is a process of separating different production processes by regions based on their inputs and technology requirements (Drucker, 1977; South, 1990; Sander, 1998). According to Drucker (1977) many products are no longer made complete in a single factory, rather they are produced partly in one factory in one country and partly in other factories in other countries to serve world markets. Production sharing is practical in the manufacture of aircraft, automobiles, wearing apparel, electronics instruments, sporting goods and toys. Outward processing on the other hand is a production option utilized by multinational corporations (MNCs) through their subsidiaries distributed all over the world (Drucker, 1977; South, 1990; Warr, 1990; Grunwald, 1991; Sander, 1998). According to South (1990), outward processing involves the sending of components and supplies to their various subsidiaries for processing and assembly into complete units for re-export. This was the case in the Mexican border industrialization program that was devised to attract primarily labor-intensive subsidiaries of the US parent plants to the northern border region. Through this program US parent plants could send materials and components to their subsidiaries in Mexico for processing and assembly for re-export (South, 1990). All these production processes were initiated through the establishment of maquiladoras a form of export processing zones in Mexico. Previously outward processing had been utilized in South Korea, Taiwan and Hong Kong in the same fashion, whereby US and Japanese parent plants had established subsidiaries mainly labor intensive operations in the South East Asian economies in order to manufacture products for export (Warr, 1989; South, 1990; Grunwald, 1991; Sander, 1998).

Outward processing and production sharing are characterized by the principle of sub-contracting arrangements. Subcontracting is an arrangement whereby a firm sublets whole or part of the production process to an independent firm (Warr, 1989; South, 1990; Grunwald, 1991; Opondo, 1997; Sander, 1998). These production options are highly integrated and hence dependent on speed of delivery, low inventories, close contacts, close technical supervision and low operation cost. Due to the incentive scheme within the EPZs, firms enjoy a faster-duty-free customs service and a more rapid delivery system to meet the just-in-time manufacturing criteria. They are further provided with low-cost processing, offshore assembly and quality industrial infrastructure. Due to these locational and operational advantages, these spaces have attracted firms that are internationally mobile. These firms can easily locate and relocate within the zones due to the low investment costs in terms of industrial infrastructure available for lease. EPZs are

also seen to be unique from other industrial spaces in Kenya, because firms within them are free from the industrial regulations applicable elsewhere in the country. They are for example exempted from the national labor laws, laws fixing minimum wage rates, and social insurance taxes paid by the employers (EPZ ACT, 1990).

2.8 Status of Export Processing Zones in Kenya

This study examined four EPZs located in Nairobi and Athi River town. These are Sameer Industrial Park, Rafiki, Thomas De La Rue and Athi River Public Zone. Sameer Industrial Park was developed by Firestone East Africa between 1988 and 1990 and it is located within Nairobi's industrial area (Map 1). At the time this study was undertaken the zone had six firms (Appendix 1). Rafiki EPZ was completed in 1997 and is located in the minor industrial area of Nairobi at Ruaraka. This zone had a total of eight firms at the time of this study (Appendix 1). Thomas De La Rue on the other hand was completed in 1994 and manufactures bank notes, checks, vouchers and other security documents for both the domestic and export market. While the Athi River EPZ, which was gazetted in 1990 is Kenya's largest public zone. The zone is situated on 339 hectares of land in Athi River (Mavoko Township). The property is managed by the EPZA and at the time of the research it had a total of ten firms actively manufacturing and providing services to both domestic and export markets (Appendix 1).

2.9 Summary

The concept *new industrial spaces* has been utilized in this study as an explanatory model in an attempt to understand the evolutionary and structural characteristics of the EPZs in Kenya. Like the concept *new industrial spaces*, which came up as a result of the transition from fordism to post-fordism, EPZs in Kenya have evolved as a result of the transition from the ISI to the EoI strategies. The *new industrial spaces* characteristic of the post-fordist mode of industrial accumulation has exhibited quite different structural characteristics from the old industrial mass production centers characteristic of the fordist mode of industrial accumulation.

Similarly, like the concept *new industrial spaces*, EPZs have exhibited quite different operational and structural characteristics from other production spaces characteristic of the ISI strategy. These spaces differ from other production spaces in the host economy because they are entitled to certain incentives not applicable to other manufacturing firms within the economy.

3. STRUCTURAL CHARACTERISTICS

3.0 Introduction

This chapter examines the structural characteristics of EPZ firms in Kenya with special reference to zones located in Nairobi and Athi River. Structural characteristics are variables such as firm size, number of operatives, ownership, technological orientation, product types and locational orientation among others, which are crucial in understanding different types of firms in a region (Ogendo, 1972; Wegulo, 1984; Kinyanjui 1987; Opondo, 1989; Miyogo, 1997). According to Chapman and Walker (1991), such aspects have proved handy in distinguishing similarities and differences between firms in a region. The significance of understanding the structural characteristics of firms in the geography of manufacturing has been outlined in several studies. For instance, many empirical studies (Keeble, 1976; Massey, 1984; Massey and Allen, 1988; Chapman and Walker, 1991; Scott and Storper, 1992) on industrial location dynamics, note that a fundamental influence upon changing levels of manufacturing activity in different areas are the spatial variations in the existing industrial structure. These further state that industrial structure is in itself largely the product of location forces, which in the long term bring about different mixes of industry in different areas (Keeble, 1976).

According to empirical studies on EPZ firms (Warr, 1989; South, 1990; Grunwald, 1991; Chandra, 1992; Kaplinsky, 1994; Sander, 1998) some of the structural characteristics exhibited by EPZ firms are the types of industry, size of labor force and labor force composition in terms of gender. The present study attempts an assessment of the structural characteristics of the EPZ firms in Kenya with special emphasis on aspects such as, ownership structure, nature of operations, input types, technological orientation, product types, markets, labor requirements, firm size and production processes. The structural characteristics are collapsed into smaller units for a detailed analysis and understanding of the EPZ firms as new industrial spaces in Kenya.

3.1 Data Collection, Analysis and Interpretation

Both primary and secondary data were used in this study. Interviews were conducted by use of structured questionnaires administered to all EPZ firms and a sample of employees within the firms. A sample size of 250 employees was selected from 5,450 employees using stratified random sampling. The proportion of the employees sampled from each firm was based on its percentage share of overall employment (5,450) in the 25 firms. The hypothesis examined in this section states that: "There are no significant differences in the structural characteristics of EPZ firms in Nairobi and Athi River". Descriptive statistics such as percentages, frequencies and cross tabulations were utilized in presenting the structural characteristics and labor conditions

within the EPZ firms.

3.2 Nature of Operations

Production sectors within EPZs in Kenya were examined in terms of assembly-type, garment manufacturing, agro-processing, construction, pharmaceuticals and printing. Activities such as these have in common a low-level technology and high labor content because of the difficulty of mechanizing their production processes (Sagawe, 1996). Therefore, based on the mentioned categorization, the production activities within the EPZs were distributed as shown in Figure 3.1. The results indicate that assembly-type and garment manufacturing are the predominant operations within the four EPZs accounting for more than half of all the operations. The major assembly-type operations observed in the EPZs are assembly of computers, electronic, bulbs, batteries, dartboards and fishing hooks. From the study results, it is imperative to note that the predominance of assembly type operations within the EPZs in Kenya is because these firms do not require massive investments since they depend mostly on their parent companies for the semi-processed and assembly components. Empirical studies (Warr, 1989; South, 1990; Grunwald, 1991; Sander, 1998) with a focus on the nature of operations within EPZs indicate that such zones are normally dominated by assembly-type operations.

Figure 3.1: Nature of Operations
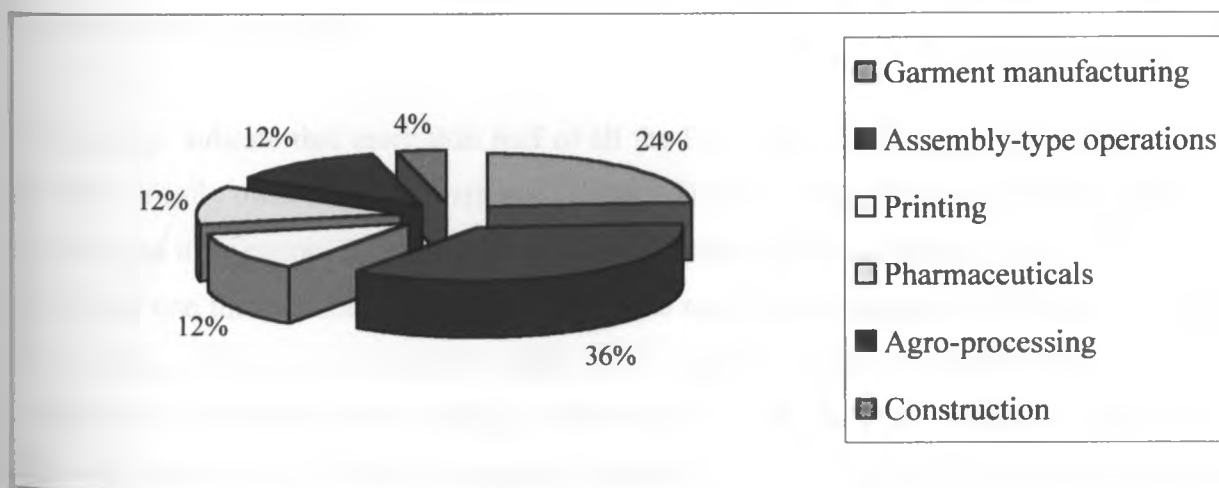
Source: Research Data, 2000.

3.3. Types of Inputs

The nature and type of inputs that support manufacturing and service activities in a region is an important variable of the industrial structure, hence the need to look at the type of inputs utilized by EPZ firms in Kenya. In this study, the types of inputs utilized by EPZ firms are categorized as either primary or secondary. Primary inputs are those extracted from their source in their natural state. Within this category inputs such as unprocessed agricultural products are

predominant, while secondary inputs are semi-processed for further use in the production of value added products. These inputs include among others leather, textiles, and electrical components. The findings from this study indicate that most EPZ firms utilize secondary inputs. For instance, four-fifths of all the EPZ firms utilized secondary inputs with only one-fifth using primary agro-based inputs. This is because more than half of the EPZ firms in Kenya are subsidiaries of foreign firms acting as assembly platforms dependent on semi-processed parts and components. The most common secondary inputs utilized by EPZ firms are, textiles, computer parts, electronic and electrical parts, chemicals, garment accessories (buttons, zips) and paper. While primary inputs are limited mostly to fresh fruits, vegetables and flowers. The study findings indicate that most EPZ firms rely on semi-processed inputs such as textiles, computer and electronic parts in the assembly of exportables.

3.4 Ownership

Ownership structure in this study was examined based on three categories as either locally owned, foreign owned or joint ventures. The three categories are the major guidelines used in the analysis of the ownership structure of EPZ firms. Wholly locally owned firms are those with 100 percent local shareholders. Wholly foreign ownership refers to the firms with 100 per cent shares controlled by foreigners. While joint ventures are defined as shared equity undertakings between two or more parties, each of which holds at least a certain percentage of the equity (between foreign and local).

The findings indicate that more than half of all the EPZ firms are foreign owned while the rest are either locally owned or joint ventures (Table 3.1). The foreign firms are further categorized according to their countries of origin with UK and India having the highest shares (Figure 3.2). More than one third of the firms from the UK are subsidiaries engaged in computer assembly and printing. While, most subsidiary firms from Asia (especially India, Pakistan, Hong Kong and South Korea) predominantly engage in the production of garments. Since most EPZ firms in Kenya are subsidiaries of foreign companies (Figure 3.2) they act as part of the production chain heavily dependent on assembly parts (semi-processed inputs).

Table 3.1: Joint-venture equity shares

Local equity shares %	Foreign equity shares %	%
10	90	14
20	80	14
30	70	14
40	60	14
50	50	43
		100

n = 25 firms
Source: Research Data, 2000

Figure 3.2: Firm Ownership by Country of Origin
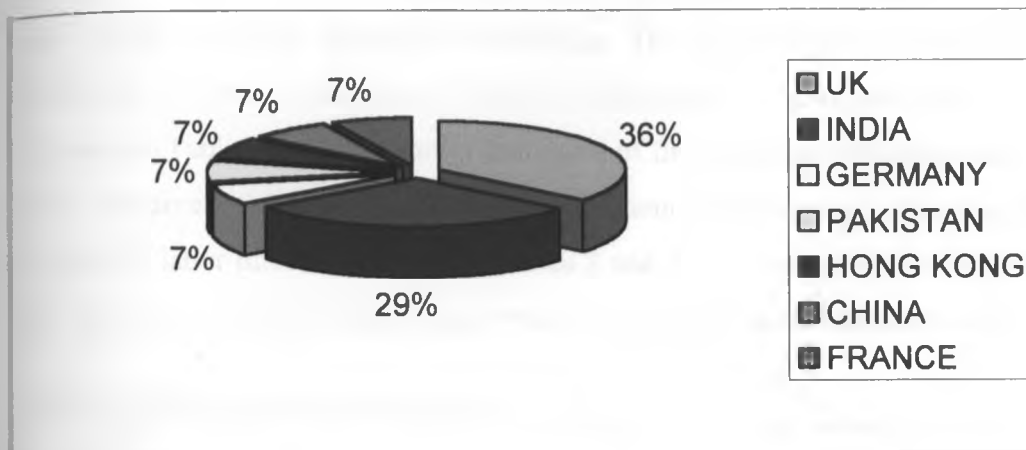
Source: Research Data, 2000.

3.5 Technological Orientation

The type of technology employed by a firm is a very important aspect of industrial structure. A firm's technological orientation influences among other things the scale of production, capacity to generate employment opportunities and transfer of technology (Wegulo, 1984; Warr, 1989; South, 1990; Miyogo, 1997). In an attempt to understand the type of technology utilized by EPZ firms, two types of technological orientations were assessed; these are labor and capital-intensive technologies. Labour-intensive technology refers to a production or manufacturing system not fully mechanized and highly dependent on human labour. Capital-intensive technology on the other hand is the type of production that has fully been mechanized and hence relies heavily on the use of machines.

The findings from this study show that more than two thirds of the firms utilize labor-intensive type of technologies. Assembly-type and garment manufacturing are prominent users of labor-intensive technology. These are firms that manufacture products with a well-known manufacturing process with routine production runs (South, 1990). Such activities have in common a low level production technology and high labor content because of the difficulty of mechanizing their production processes. For instance, in the garment manufacturing firms large

numbers of operatives are required to perform assembly line operations such as designing patterns, cutting and operating sewing machines. Since such production processes cannot easily be mechanized, firms have opted to intensify the use of labor that is efficient and cheaper.

On the other hand, firms manufacturing cotton yarn, billboards and security documents utilize capital-intensive type of technologies. Their assembly lines are organized in such a manner that machines are programmed to produce certain types and quantities of goods and do not require large numbers of operatives. Apart from the two major types of technologies discussed, firms manufacturing products such as television sets, computers and pharmaceutical products combine both capital and labor intensive technologies. The categorization of products and the type of technology utilized is shown in Table 3.2. Based on the categorization of the technological orientation, Table 3.2 clearly shows that most of the products manufactured within EPZs are of labor intensive in nature. Plate 1 shows a garment manufacturing assembly line which clearly exhibits its labor intensiveness while Plates 2 and 3 show assembly lines within pharmaceutical and cotton yarn spinning firms a clear evidence of their capital-intensive nature.

Table 3.2: Technological orientation

Product types	Technology type	Reason for classification
Garments, horticulture, bulbs, batteries and fishing components	Labor intensive	Large numbers of operatives on the assembly lines (intensive use of human labor).
Drugs, computers, television sets, cotton yarn, billboards, dartboards and security documents.	Capital intensive	Predominant use of machines and small numbers of operatives.

Source: Research Data, 2000.

Plate 1: Garment Manufacturing Assembly Line

Source: Research Data, 2000.

Plate 2: Cotton Yarn Spinning assembly line
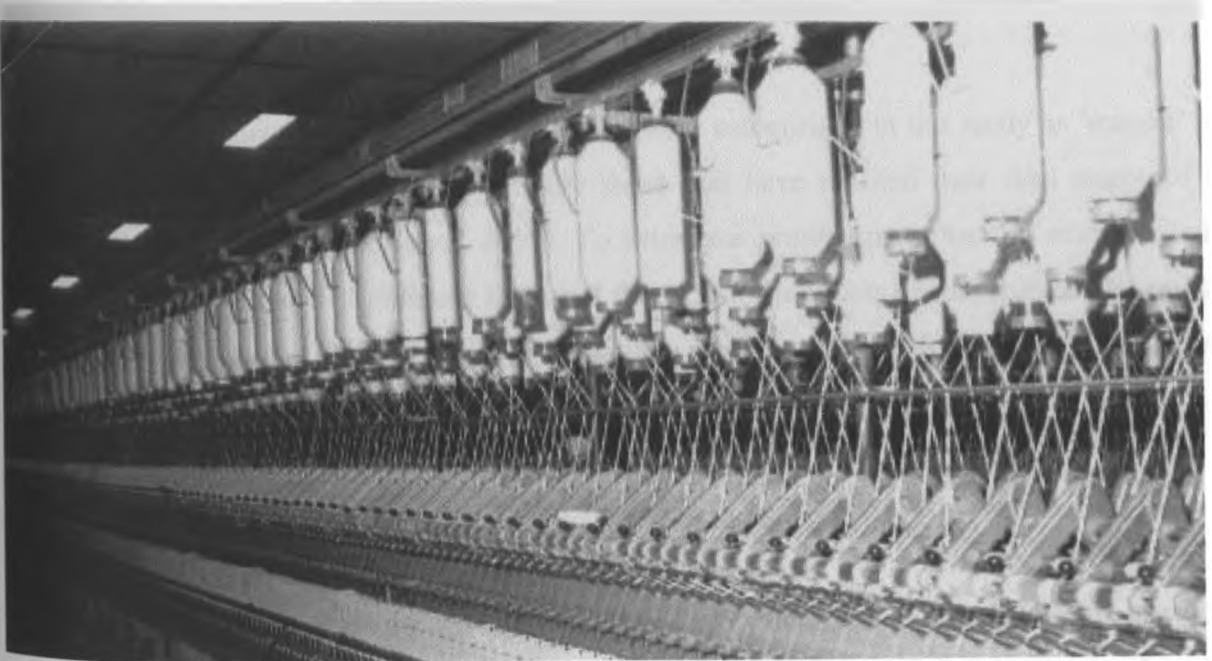
Source: Research Data, 2000.

Plate 3: Pharmaceutical firm assembly line

Source: Research Data, 2000.

3.6 Types of Products

The types of products manufactured by EPZ firms are categorized in this study as 'mature' and 'non-mature' products. Mature products are those that have reached their final stages of the product cycle (Dicken, 1986; South, 1990). To determine product maturity, this study looked at the production processes of different firms and the types of products manufactured. The product cycle model is used in describing the evolutionary processes of a product and its locational change.

3.6.1 The product cycle model

The *product life cycle model* provides a useful conceptual framework for the analysis of assembly plant locational change. The product cycle model has had wide applications in studies on the relocation of industry from the metropolitan to rural areas and from more developed to the developing countries (Vernon, 1966; Erickson and Leinback, 1979; Hansen, 1981; 1982; Suarez-Villa, 1984; Storper, 1985; Dicken, 1986). The model identifies several phases in production that have locational implications.

According to Dicken (1986), the *product cycle model* describes three paths along which a

product develops in relation to its technological, production processes and labor requirements. These phases are the early, middle and mature or late phases. The early phase of a product development is characterized by flexibility in production technology as the product is still in its initial designing stage. The most ideal location for such an operation would be the developed countries because of the availability of reliable communication and proximity to the R&D centers. The middle or the growth phase of the product is highly market oriented. This is the improvement phase coupled with the search for market for the product. The most appropriate location for the re-designing of the product are developed countries with the advantages of R&D centers and technology for improving the product.

Lastly, the mature or late phase, of the cycle is characterized by little technological change of the product, a well-established manufacturing process, routine production runs, product competition, and saturated markets (Table 3.3). Attempts to reduce production costs by substituting capital for labor becomes paramount. For some products, search for cheap labor result in branch plants in the Third World countries. Figure 3.4 shows the production processes commonly relocated to the developing countries. The manufacturing process or the labor-intensive part of the process is conducted in labor-abundant foreign locations with the product or sub-assembly being re-imported back to the metropolitan (MDCs). The underpinning logic of this model is that as the production processes matures, industries are assumed to shift their location to more labor abundant and wage competitive regions. According to South (1990), most of the EPZs productions are characterized by "mature" products, labor-intensive technology, and manufactured by well-known standardized processes. For example, the manufacture of cast iron air compressors, lighting ballast, magnetic tape heads, the "stuffing" of circuit boards, and garment are examples of mature products.

Table 3.3: Characteristics of the production process according to the product cycle model.

Production characteristics	Stages in product cycle		
	Early	**Growth**	**Mature**
Technology	Short runs, rapidly changing techniques, and dependence on external economies.	Mass production methods gradually introduced, and variations in techniques still frequent.	Long runs and stable technology, and few innovations of importance.
Capital intensity	Low	High, due to high obsolescence rate	High, due to large quantity of specialized equipment.
Industrial structure	Entry is technically determined with numerous firms.	Growing number of firms, many casualties and mergers. Growing vertical integration.	Market position and financial resources affect entry. Number of firms declining.
Critical labor requirements	Scientific and engineering.	Management	Unskilled and semi-skilled labor.

Source: Hirsch, 1967, P 27

3.6.2 Products and Processes

The products manufactured by EPZ firms are distributed as shown in Figure 3.5. Most of these products are produced on standardized routine assembly lines. The assembly line is organized in such a way that machines and workers are programmed to manufacture uniform products. The assembly line is characterized by task fragmentation whereby to manufacture a complete product it has to pass through different stages (Figure 3.3).

Figure 3.3: Assembly line procedures in garment manufacturing
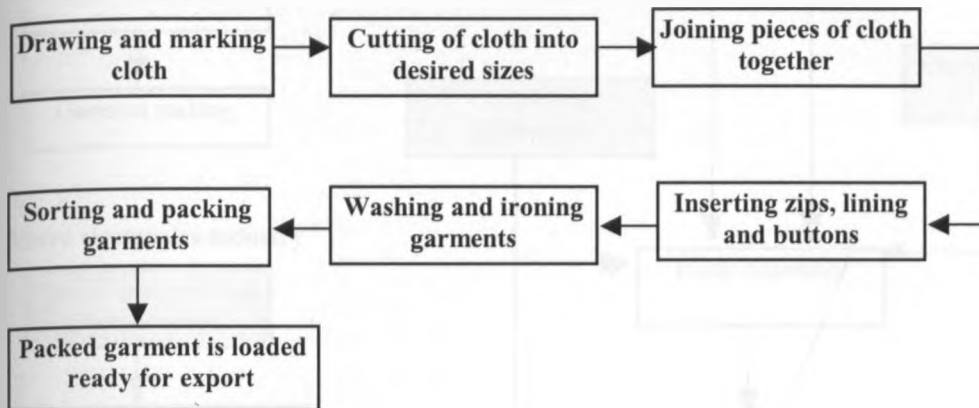
Source: Research Data, 2000

EPZ firms that manufacture pharmaceuticals, bulbs, batteries, computers, television sets, garments and currency act as assembly platforms importing semi-processed inputs from the UK, South Korea, India, Pakistan and France among others for the assembly of various products for export. The products manufactured in the EPZ firms are characterized by little or no technological change whereby they do not undertake R & D. For instance, EPZ firms that manufacture products such as computers, bulbs, batteries, television sets and fishing components import most of their inputs in semi-processed form. The pharmaceutical firms are supplied with all the required chemicals and production technologies by their parent firms. Therefore, it is only a matter of mixing the chemicals to come up with the final product. Garment manufacturing firms on the other hand are guided by fashion and design change from the importing countries. For instance, the designing of the type of garment to be manufactured is the sole responsibility of parent plants in the importing countries.

Figure 3.4: Labor processes in three industries.

(I) Garment Industry

```
Fiber production,
natural synthetic
        ↓
Yarn production,
        ↓
Fabric production
        ↓
Garment making
```

(II) Automobile Industry

```
                    Tool making
            ↓                        ↓
Manufacture of body              Foundry works
       parts                          ↓
                                 Engine and Transmission
 Component                          machinery
 production
                    ↓
              Body Assembly
                    ↓
              Trim and final
                 assembly
```

(III) Micro electronics industry

```
Circuit designed and
    photographed
        ↓
Circuits etched on wafers,
        ↓
Wafers sliced into chips
        ↓
Chips bonded to circuit boards
        ↓
Chips assembled into products
```

LEGEND

□ Relatively capital intensive

□ Relatively labor intensive (processes frequently transferred to Third World countries).

Source: Crow and Thomas, 1985.

3.7 Market Orientation

Since the EPZs were conceived essentially as export-oriented production spaces, marketing of their products in the local economy is either prohibited altogether or subject to the normal import duties applicable to any other types of imported products. Some countries are more liberal than others on this policy, while others have sought to strike a balance between liberalism and restrictiveness by allowing a pre-determined proportion of the zones' output to be sold on the domestic market. In order to determine the destinations of products from EPZs in this study, the market has been categorized as external, domestic or both. The reason of assessing the market destination of EPZ manufactured products is to determine whether there are significant differences between the firms in terms of market orientation.

Figure 3.5: Product Distribution by Firms
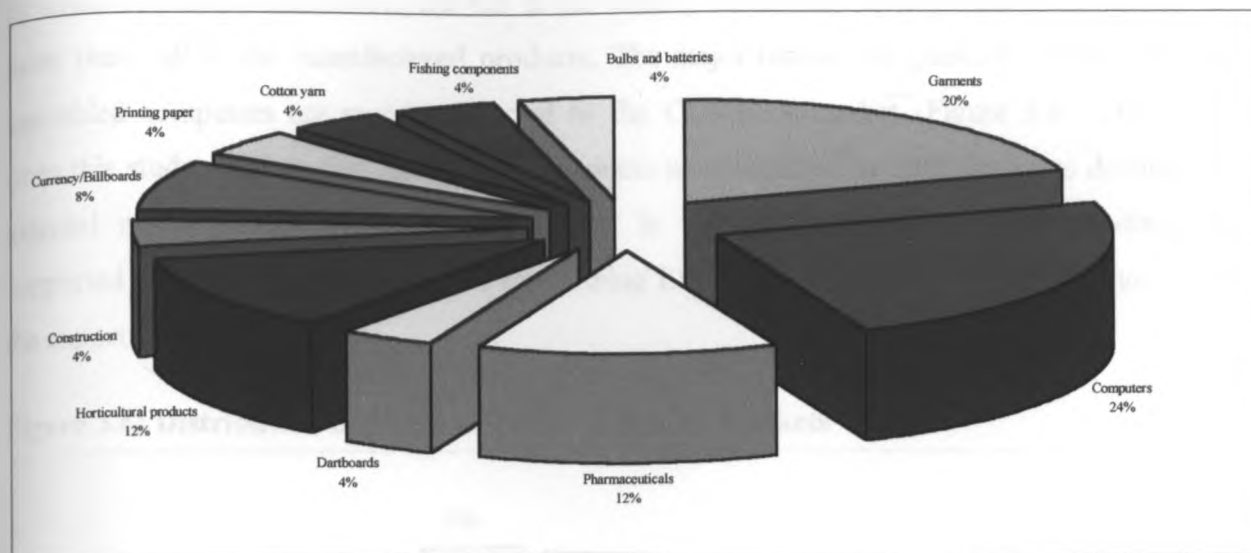
Source: Research Data, 2000.

In Kenya, according to the EPZ Act of 1990, EPZ firms are allowed to sell at least 20 per cent of their total products in the domestic market while the rest is exported but in special cases an EPZ firm can be allowed to sell more than the stipulated proportion in the domestic market. This is so because EPZs are treated as enclaves in the host economy and if a firm operating within the zone is able to pay all the necessary taxation to the customs office then it is allowed to sell the products in the domestic market. Data on the destination of final products is summarized in Table 3.4. The study findings show that no firm sells the entire consignment of its products in the domestic market. However, the proportions sold in the domestic market are very small compared to the ones destined for external markets. Garment manufacturing firms accounted for one third of all the firms selling all their products to the external markets. While one firm manufacturing security prints sold nearly half of its products in the domestic market, exceeding the proportion set by the EPZ Act 1990 of 20 per cent. The uniqueness of this firm in terms of market orientation is because the government of Kenya has sub-contracted it as the sole producer and supplier of all the country's security documents.

Table 3.4: Market Category of EPZ firms

Market orientation		Percentage
Foreign	100%	52
Both in terms of proportions		
Local	**Foreign**	
10%	90%	4
20%	80%	40
45%	55%	4
Total		**100**

Source: Research Data, 2000.

In terms of market destination, the US is the leading market for EPZ products accounting for more than half of the manufactured products. The major market for garments is the US while assembled computers are mainly exported to the COMESA market (Figure 3.6). The results from this study confirm that most of the products manufactured by EPZ firms are destined for external markets with small proportions sold in the domestic market. These findings are supported by the fact that the logic of establishing EPZs is to attract firms to produce goods for the export market.

Figure 3.6: Distribution of Firms in Terms of Major Markets
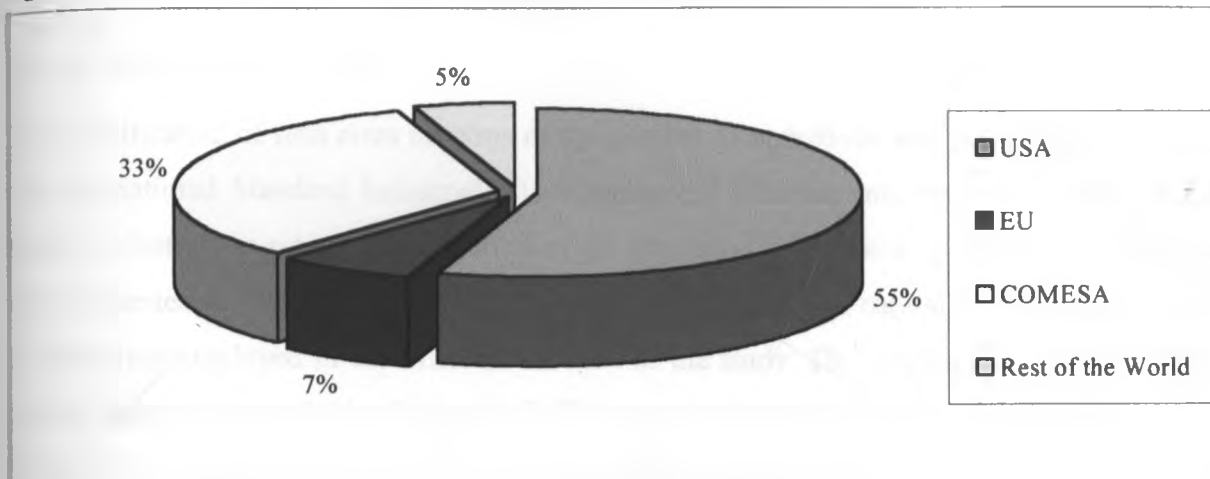
(n=25)
Source: Research Data, 2000.

Similarly, several studies which have been undertaken with a focus on the destination of EPZ manufactured products indicate that, firms located in the EPZs are responsive to external markets; most of these firms are assembly platforms that receive components and sub-assemblies and assemble them for re-export and those host countries have designed certain rules which stipulate that firms need to sell most of their products to external markets to generate foreign exchange and re-orient the domestic economy externally (Warr, 1989; South, 1990; The World Bank, 1992; Chandra, 1992; Kaplinsky, 1994; Sander, 1998).

3.8 Firm Size

There are generally two approaches to the problem of defining firm size. The first one is by use of analytical or quantitative measures such as capital investment, value of sales, number of workers and energy consumption as convenient measures of scale. The second approach takes into consideration the functional aspects where industries are classified on the basis of descriptive qualitative data such as: organization and management of industrial units; methods of their production and their influence on the market (Hoseltz, 1968, Staley and Morse, 1965).

This study uses analytical or quantitative measures of capital investment and number of operatives in the EPZ firms to determine their size. The firms are categorized as very small, small and medium sized based on their levels of capital investments and number of operatives (Table 3.5).

Table 3.5: Firm Size Categorization

Capital Investment (Kshs)	Category	Operatives/workers
1.1m – 100millions	Very small	1-50
101m – 500millions	Small	51-200
501m – 10billions	Medium	+ 201

(n=25)
Source: Research Data, 2000.

The classification of firm sizes in terms of the number of operatives was undertaken in line with the International Standard Industrial Classification of all economic activities (ISIC) and the Kenya Industrial Standard Classification of all economic activities (Ogendo, 1972). Managers were requested to provide information on the amount invested in capital goods and the number of operatives employed in each firm at the time of the study. The frequencies were run and the results summarized in Tables 3.6 and 3.7. The frequencies show that slightly more than half of all the EPZ firms fall in the category of very small firms. For further analysis capital investment and the number of operatives are cross tabulated and the results are shown in Table 3.8. The cross-tabulation of the two variables is important in understanding how they influence each other.

Table 3.6: Capital Investment

Category	Percentage Share
1.1 M-100 M	56
101M-500M	24
501M-10B	20
Total	100

(n = 25)
Source: Research Data, 2000.

Table 3.7: Number of Operatives

Category	Percentage Share
1-50	52
51-200	24
+201	24
Total	100

(n = 25)
Source: Research data, 2000

Table 3.8: Distribution of capital investment by number of operatives

| Capital investment | Number of operatives | | | |
	1 - 50	51 - 200	200+	Row Totals
1.1M – 100M	16.0%	16.0%	24.0%	56.0%
101M – 500M	20.0%	4.0%	-	24.0%
501M – 10B	16.0%	4.0%	-	20.0%

(n=25)

Source: Research Data, 2000.

Interpretation

The cross tabulations shows that EPZ firms with low capital investment between 1.1M-100M were dominant in the category of 200+ workers. While the EPZ firms with a capital investment between 101M-500M and 501M-10B were more dominant in the category of 200 and below workers. This shows that most of the firms in the category of 501M-10B are capital-intensive and heavily dependent on machines in their production processes. Most of these firms rely on heavy and expensive machines as compared to the 1.1M-100M category, which are labor-intensive and rely on simple and light machines. The cross tabulations further show that almost three-quarters of all the EPZ firms were in the category of very small and small firms in terms of employment levels; while slightly more than half were in the category of very small and small firms in terms of capital investment levels. Hence, it is evident that the higher the investments the lower the number of operatives, and vice versa. The findings from this study therefore reveal that most of the firms located within the EPZs in Kenya are small based on their capital investment levels.

3.9 Labor Characteristics

Labor and its inherent characteristics is a very important variable of industrial location and structure (Massey, 1984; Frobel, 1976; Thrift, 1987). Regional differences in terms of labor characteristics have led to spatial re-organization of the industrial space economy (Scott and Storper, 1992; Thrift, 1987). Manufacturing firms with different labor requirements have been forced to re-locate to different regions based on their *product life cycle* (Frobel, 1976; Massey, 1984; Dicken, 1986). Consequently these firms have a tendency to hire labor on the basis of certain characteristics such as age, sex and skills of the workers.

The labor condition in these firms is an important aspect in understanding the welfare of the workers in the EPZs (ILO, 1998). For example, Frank (1981), Killick (1996), and ILO (1998) argue that in an attempt to increase productivity and cut down on production, the workers' welfare is often compromised. Therefore, this study examines the age, sex, skills, nature of employment (casual or permanent), wages, working hours and the working environment to

determine whether there are significant differences among the EPZ firms in Kenya.

Age distribution

The sample data of 250 workers engaged in all the 25 firms was categorized into age groups of 15-25, 26-35 and 36 and above years. The results of the frequency indicate that about three-quarters of the workers were in the category of 15-25 years. Most of these workers in the age bracket of 15-25 were engaged in assembly line operations while workers in the age bracket of 26-36+years performed supervisory and managerial tasks. According to the firm managers, the predominance of hiring workers aged between 15-25 years to work on assembly lines is because they are able to withstand the pace and pressure of work and are capable of meeting production targets. Young workers are perceived to be easier to recruit, train on the job, healthier and more efficient.

Sex distribution

The predominant sex category in the EPZs was measured by looking at the percentage differences of women over men in each firm and also based on the types of products manufactured. Out of a population of 5450 workers employed by the EPZ firms, female labor accounted for two thirds, while men accounted for one third of the total labor force (Table 3.9). Examined in terms of the products manufactured, garment manufacturing firms accounted for the largest number of women. The predominance of women in the garment, bulb, battery, horticulture and fishing components manufacturing firms was based on the repetitive and monotonous nature of their operations. Managers of the garment, battery and bulb, horticultural and fishing component firms when asked why they preferred female labor to male, echoed similar sentiments. They argued that they preferred young women aged between 15-25 years because they are considered dexterous and more able to cope with the repetitive work characteristic of these production processes. Tasks such as cutting, joining, and packing of garments, assembling of bulbs and batteries, and sorting, bunching and packaging of horticultural products are the major tasks performed by women. Packing of garment takes two forms, whereby, the first one is packing in cartons done mostly by women since it is considered a very repetitive task while men do packing of the cartons into containers ready for shipment because it is heavy work. While the predominance of men in pharmaceuticals, security document printing, bill boards, computer, TV assembly and construction firms is based on the fact that these products require specialized technology which men are perceived to posses.

Table 3.9: Sex distribution by product category

Product category	% Women	% Men	Total percentage
Garment/Textiles	53.1	28.0	81.1
Pharmaceuticals	0.7	0.9	1.6
Assembly of bulbs and batteries	1.0	0.4	1.5
Dartboards assembly	0.8	0.7	1.5
Printing (Security documents and Billboards)	1.2	2.6	3.8
Horticultural Processing	4.0	1.9	5.9
Computer/TV assembly	0.3	0.9	1.2
Fishing components	0.9	0.4	1.3
Construction	0.1	2.2	2.3
Total	**62**	**38**	**100**

Source: Research data, 2000

Labor Skills

To determine the labor skills mostly utilized by EPZ firms in Kenya, classification was done based on three categories: skilled, semi-skilled and unskilled labor. Managers of the 25 firms were asked to indicate the nature and type of skills utilized by their firms. Skill categorization in this study was based on the level of education and technical qualifications. Respondents with a university degree plus other professional qualifications were classified as skilled. Those who had completed secondary education plus other professional qualifications were classified as semi-skilled. Lastly, those ones who had completed either primary or secondary education without any professional qualifications were classified as unskilled.

The results of the study show that more than half of the firms predominantly relied on semi-skilled and unskilled labor (Table 3.10) and (Table 3.11). EPZ firms that manufacture garments, dartboards, bulbs and batteries, horticultural products, and fishing components are the major users of semi-skilled and unskilled labor. These EPZ firms engage in simple assembly operations devoid of or with minimal technical skill requirements. Furthermore, based on their routine production processes workers can easily be taught within a short time to perform these tasks. According to the 25 firm managers they recruited workers without any skills whom they could train on-the-job for at least two weeks. After the short training the workers are capable of performing efficiently and effectively. Firms engaged in the assembly of computers on the other hand recruit skilled labor because these are specialized tasks that require skilled labor. While firms engaged in currency printing and pharmaceuticals relied on all the three skill categories. Therefore, the study findings show that the differential labor skill requirements by each firm are based on the type of product manufactured by each firm and its production processes. Routine production assembly lines are mostly inclined to use semi-skilled and unskilled labor, while firms dealing in specialized products tend to hire skilled labor.

Table 3.10: Skill categorization by firms

Category	%
Unskilled/semi skilled	58
Skilled	29
Unskilled/semi-skilled/Skilled	13
Total	**100**

(n = 25)
Source: Research data, 2000

Table 3.11:Labor-skill distribution by operatives

Category	%
Unskilled/semi skilled	64
Semi-skilled	28
Skilled	8
Total	**100**

(n = 250)
Source: Research data, 2000

Nature of engagement

Engagement of workers in this study was assessed in terms of as either casual or permanent employees. Casual employees are temporarily hired in a firm, are not covered by collective bargaining agreement and can be laid off at will when the amount of work reduces. While permanent employees on the other hand are usually covered by a collective bargaining agreement and entitled to benefits such as a stable salary, social security and holidays (annual leave) (ILO, 1998). Due to the heightened competitive pressures on the world market firms have been forced to reduce production costs by depending on casual labor, which can easily be hired when there is work, and easily laid off when market demand is low (Killick, 1996; ILO, 1998). Therefore this study further examines the type of labor utilized by EPZ firms in Kenya.

The results show that more than two thirds of the EPZ firms depend on casual workers while the rest depend on permanent employees. Garment, horticultural, bulbs, battery, fishing components and dartboards manufacturing EPZ firms rely mostly on casual labor hired for short periods and normally paid after a fortnight after which they can be rehired or dismissed depending on the amount of work within the firm. In these firms workers are paid on a fortnightly basis, are not entitled to annual leave, retirement and medical benefits. When the demand for products increases EPZ firm managers are forced to engage more workers and when demand slackens they are forced to reduce the numbers. The general preference for casual labor is because they are cheap to manage, and non-militant. While firms engaged in currency printing, pharmaceuticals and assembly of computers depend on permanent labor most of whom are paid on a monthly basis, are entitled to annual leave, retirement and medical benefits. The EPZ firms

that prefer permanent labor claimed that such labor enabled them to build trust among the workers and to cut down on training costs.

Wages

It is often assumed that wage rates are principal factors determining the choice of a production location and EPZs are often characterized as enclaves of cheap labor (Frobel, 1976; Killick, 1996; ILO, 1998). Wages in industries that are involved in international subcontracting are in most cases so low that they are not sufficient to reproduce the workers as a social class. According to Frobel (1976), low labor cost is the *raison d'être* for the relocation of assembly operations from the industrialized countries to the Third World countries, believed to have an abundant cheap labor force. For instance the relocation of assembly plants from the US and Japan to countries like Mexico, Korea, Singapore, Mauritius and Taiwan has been due to the availability of cheap labor (Grunwald, 1991; South, 1990).

These are some of the countries that have embraced the EPZ strategy to attract international capital. Therefore, to be able to compete for the already scarce foreign direct investment (FDI), these zones offer investors cheap wage rate levels. Table 3.12 shows the hourly wage costs in EPZ firms in selected developing countries in US dollars for 1993. The wage rates differ for each country with Morocco, Tunisia and Mauritius having the highest hourly rates while Zambia and Bangladesh have the lowest.

Table 3.12: Hourly wage costs for selected LDCs with EPZs in US dollars (1993)

REGION	COUNTRY	WAGE COSTS
AFRICA	Egypt	0.43
	Mauritius	1.04
	Morocco	1.06
	Nigeria	0.27
	Tunisia	1.54
	Zambia	0.24
	Zimbabwe	0.35
ASIA	Bangladesh	0.16
	China	0.25
	India	0.27
	Indonesia	0.28
	Malaysia	0.77
	Pakistan	0.27
	Philippines	0.33
	Sri Lanka	0.35
	Thailand	0.71
	Vietnam	0.26
CENTRAL AMERICA	Costa Rica	0.88
	Dominican Republic	0.64
	Honduras	0.48
	Jamaica	0.83

Source: ILO, 1996 (labor standards in EPZs: A Southern African Perspective)

Table 3.13: Wage rate distribution in the EPZs in Kenya

Kshs	Dollars	%
130-200	1.70 - 2.7	80
201-300	2.7 - 4.0	15
+ 301	+ 4.1	5
Total		100

Exchange Rate in the year 2000 (Kshs 75.0 = 1 U.S. Dollar)
Source: Research Data, 2000

Data on the daily amount paid to employees within the EPZ firms was collected from both the 25 EPZ firm managers and a sample of 250 employees. The daily wages paid to workers was categorized into three levels (Table 3.13). More than two thirds of workers in the EPZs in Kenya earn between 130-200 Kenya shillings per day. Since most EPZ firms in Kenya engage their workers for an average of 9 hours per day, the average pay for each worker is 0.28 US dollars per hour. The study findings indicate that the wage rates in most EPZ firms in Kenya is very low and similar to other regions of the world especially in African countries such as Nigeria, Zambia and Zimbabwe (Table 3.12).

Most EPZ firms that engage in labor-intensive assembly operations such as garment, bulb, battery, horticultural and fishing components processing pay their workers very low wages. The reasons given for the low pay is that such operations are dependent on unskilled labor hence the justification for low wages. While on the other hand, firms engaged in operations such as currency printing, computer and electronic assembly pay their workers between 200-300 Kenya shillings per day. This is justified on the basis that these firms engage in very sensitive, specialized and technology oriented operations that require skilled labor force.

Working Hours

Working hours in the EPZs are believed to be very long with few vacation days for the employees in these zones. For instance, in the manufacturing industry in Hong Kong there are frequently more than 60 working hours per week (Frank, 1981; Killick, 1996; ILO, 1998). According to a study mission conducted by the ILO, EPZ employees in Hong Kong worked 60 hours per week (ILO, 1998). Thus, the findings from this study show that the Hong Kong EPZ operatives worked 15 hours more than the official 45 hours per week. Most of the workers in these zones worked for a minimum nine hours per day and even more during peak periods (Frank, 1981; Killick, 1996; ILO, 1998).

The results from the present study indicate that the minimum number of hours worked in a day the EPZ firms amounted to nine hours. Since the workers are engaged for six days a week they work for a total of 54 hours. However, in the EPZ firms such as garment and textiles, bulb and batteries, dartboards, horticultural and fishing components a working day could be extended by up to four hours during peak periods. Therefore, some firms instead of increasing the number of workers opt to increase the number of hours per employee. This according to the EPZ firm managers is seen as an efficient way of increasing production at minimal cost. Workers on the other hand complained of fatigue and poor pay for long hours of work.

Welfare and working environment

In this study welfare is looked at in terms of workers benefits, health and collective bargaining, while environment is the ability of a firm to afford its workers a clean and safe place of operation. Results from the field interviews show that majority of workers are not entitled to annual leave or health and social security, while union membership is discouraged for all workers engaged in the EPZ firms. Most of the temporary workers interviewed during the field survey claimed that one was not allowed to join a trade union. Furthermore, due to high unemployment rate in Kenya most workers said that they are forced to take up jobs under very unfriendly conditions and if one inquires about the benefits entitled to him or her they might not be recruited. This is aimed at instilling fear amongst the workers not to bargain for their rights at the workplace.

According to the EPZ firm managers, discouraging workers from joining labor unions is aimed at reducing industrial unrest. Most EPZ firm managers are extremely scared of trade union activities and are totally opposed to their workers joining trade unions. In terms of the safety of the workers, four fifths complained of the unreliability of the protective clothing provided (masks, gloves, overalls, and gumboots) and not all the workers are provided with them. For instance, most workers in garment manufacturing firms complained of being pierced by needles and getting burnt while ironing the clothes, while those in the bulb and battery firms complained of chemical injuries and eye straining. Interviews with workers showed that more than three-quarters complained that if one was hurt while working he/she would not be compensated. Furthermore, the positioning of machines in most firms require most workers to remain standing or seated throughout (Plate 1) in the same position for up to nine hours or more making them tired and worn out.

3.10 Summary

The study findings reveal that most EPZ firms depict similar structural and operational characteristics. An analysis of the structural aspects such as production orientation, ownership structure, technological orientation, types of inputs and products, markets, firm size and labor reveal that there is no major difference. For instance, assembly-type and garment manufacturing remain major activities within the Kenyan EPZs. Most of these firms are foreign-owned with very few joint or local ventures. These firms depend mostly on secondary inputs such as assembly components and semi-manufactures. The products manufactured by EPZ firms are mostly 'mature' which predominantly rely on a labor-intensive technology. EPZ firms export most of their products, however, there are few firms that produce large quantities for the local market. A marked example is the currency-printing firm that sells half its products locally.

The EPZ firms are mostly small or medium sized enterprises in terms of both the amounts of capital investment and numbers employed. Semi-skilled and unskilled labor commonly utilized in the EPZs, is normally hired on casual basis for it is cheap and can easily be laid off when the amount of work reduces. The study findings also indicate that the workers in all the EPZ firms have similar working conditions. Therefore, the null hypothesis that: there are no significant differences in the structural and labor attributes of EPZ firms cannot be rejected because most EPZ firms exhibit similar structural characteristics. Hence, the findings from this study show that most EPZ firms in Kenya exhibit similar structural characteristics with very minor differences.

4. THE DYNAMICS OF NEW INDUSTRIAL SPACES

4.0 Introduction

This chapter examines the dynamics of EPZ firms with special emphasis on their linkages with the host economy and marketing strategies. The study of linkages emphasizes the connections or agglomerations between economic activities within a relatively restricted geographic area (Marshall, 1987; Healy and Ilbery, 1990). In the final analysis, any firm is but a complex chain of production held together by direct or indirect linkages between a series of firms. It is through such linkages that external economies are transmitted to individual production units through its network of inter-connections with other elements in a system. Studying linkages is important because they show how establishments and firms are related to one another and to the wider environment in which they operate (Healey and Ilbery, 1990).

The interest here is to examine the relationship between the EPZs and the host economy. This relationship is seen to occur in both directions in that the pattern of linkages influences the development of certain sectors in the host economy. In the account which follows, particular emphasis is placed upon the relationships between EPZ firms and the domestic firms with respect to material linkages, employment creation, technology transfer, foreign exchange earnings, attraction of foreign direct investments (FDI) and re-orienting the economy externally.

There are two major linkages observed in a region between different types of firms. These are backward and forward linkages. Backward linkages are the interconnections of a firm to other firms from which it purchases its inputs, while forward linkages indicate the interconnections of a firm with those ones that it supplies or sells output. According to Hirschmann (1958), inter-industry interdependencies (linkages) are defined in forward and backward terms from an input-output model of the economy. In relation to backward linkages, the concern here is to identify how some firms depend on others for their industrial inputs and supplies. While forward linkages identify how some firms distribute their outputs as inputs to other firms further down the value added chain of industrial production.

4.1 Dynamism of Firms

Data on the linkage capabilities and survival strategies of the EPZ firms was obtained through interviews conducted by use of structured questionnaires administered to a sample of 250 employees and managers of the 25 EPZ firms. The hypotheses put to test are that: "There are no

significant linkages between EPZ firms and the host economy; and there are no significant survival strategies utilized by EPZ firms in a competitive world market economy". Descriptive statistics such as percentages and frequencies were utilized in summarizing the field data for further analysis. The survival strategies utilized by EPZ firms in a competitive world market economy was analyzed by use of factor analysis while the linkage capabilities of EPZ firms with the host economy was by use of the enclave approach.

However one of the major tool for measuring linkages is the input-output tables (Smith, 1984; Chapman and Walker, 1991). The input-output tables are utilized in identifying how some sectors depend on each other for their input supplies and others distribute their outputs as inputs to other industries further down the value added chain of national production. The input-output tables depict linkages between different sectors of an economy in a matrix form. This method is highly dependent on adequate and reliable data on the sectors of the national economy. It has widely been utilized in developed countries such as the US in measuring the linkage capabilities in the metal sector (Chapman and Walker, 1991). However, due to lack of reliable data on and the footloose nature of EPZ firms the input-output tables are not efficient tools for measuring their linkage capabilities with the host economy. Furthermore, since EPZs are conceived as enclaves within a host economy, their data cannot easily be reconciled with the host economy's industrial data hence a limitation in application of the input-output tables.

Thus, the enclave approach is utilized in this study as an explanatory tool in assessing the linkage capabilities between the EPZs and the host economy (Corden, 1974). According to Corden (1974), the EPZs are viewed as enclaves within the host economy capable of buying and selling goods, making and receiving transfers, and creating various external effects. This approach is utilized in assessing the effects of these three types of operations on the host economy. Corden (1974) argues that linkages between the EPZs and the host economy are bound to arise from the:

- Increase in local capital and employment of local workers;
- Buying of raw materials locally and selling final products in the external market;
- Paying taxes to the local ministry of finance; and
- Creating a variety of external effects such as labor and managerial training and the spread of modern techniques of various kinds.

In an attempt to determine the linkages between the host economy and the EPZs, two questions arise to guide the analysis:

- Does the local economy gain from the presence of the EPZs? and;
- Can taxes, subsidies or restrictions maximize the local economy's gain from the presence of the EPZs?

Corden (1974) utilized the aspects in section (A) and (B) to explain the linkages between the EPZs and the host economy (Figure 4.1).

Figure 4.1: The Enclave Approach
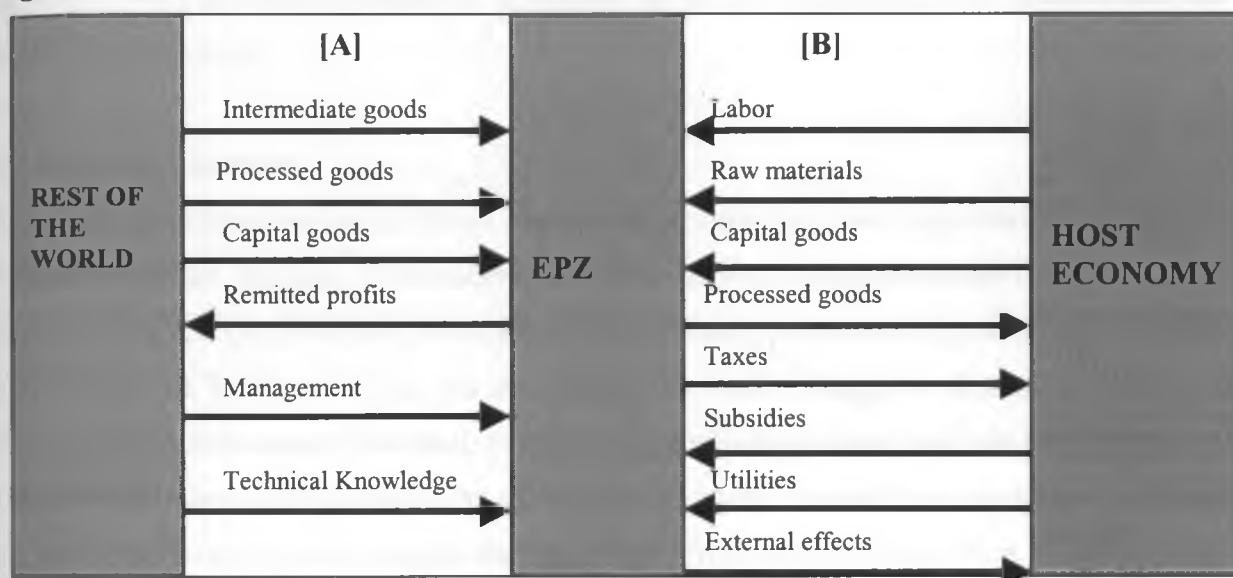
Source: Adapted from Corden (1974 and 1985)

Warr (1989) utilized the enclave approach in determining the linkages between EPZs and the Mexican economy. The study adopted the two levels of linkage (A) and (B), where (A) shows the flow of goods and financial factors between the EPZs and the rest of the world, and (B) shows the flows of the same between the EPZs and the host country. The essence of the enclave approach (Figure 4.1) is that the flows in (B) are relevant for evaluating the linkages between the zone and the host economy, but flows in (A) are not. For instance, flows in (A) entail the purchase of intermediate and capital goods from external sources, which result in outflows of foreign currency. According to Warr (1989), the major benefits of the EPZs to the host economy are employment creation, material linkages and transfer of technology. However, Warr (1989) indicates that the benefits of the EPZs can only be realized fully when they are integrated within the host economy. Therefore, by use of the enclave approach this study looks critically at the linkages between the EPZs and the host economy.

In the examination of the survival strategies utilized by EPZ firms in a competitive world market economy, factor analysis is employed. The survival strategies examined are, sub-contracting, production of quality goods, search for quality and affordable inputs, use of cheap non-unionized labor force, advertisement, standardized production processes and production by tender. Factor analysis is a statistical method that has received much attention and has widely been utilized in various disciplines to measure the importance of certain factors over others. The method separates the most significant factors from a mass of alternatives. For example, Opondo (1989) used factor analysis in determining entrepreneurial perception in Kisumu town while, Miyogo (1997) used factor analysis to determine the major factors that affect location decision-making in Kisii town.

4.2 Material Linkages

Material transactions between different manufacturing firms are a very important aspect of inter-industry linkages because it enhances interaction between different firms through material supplies, while at the same time stimulating local industrial production (Ogendo, 1972; Wegulo, 1987). Material linkages are also the mechanisms by which changes in demand are channeled through the local economy (Marshall, 1987). The study findings show that four fifths of the EPZ firms obtain more than three-quarters of their inputs most of which are secondary inputs and assembly components from foreign sources such as from the US, UK, China, Pakistan, India, Malaysia and Mauritius. Common amongst this category are the garment, computer and television manufacturing firms, which obtain most of their inputs from the US, UK and South East Asia. Other EPZ firms, which predominantly rely on foreign inputs, are the pharmaceutical, billboards, currency printing, bulbs, battery and fishing component manufacturers. While, one fifth of the EPZ firms obtain more than three-quarters of their inputs from the host economy. These firms rely mostly on primary inputs such as fresh fruits, flowers, vegetables, sisal and cotton fiber.

Managers of the EPZ firms that predominantly rely on foreign inputs argued that they are forced to import materials such as textiles and computer assembly components because they are not available locally. While some managers especially of EPZ firms engaged in cotton yarn spinning expressed concerns on the quality and reliability in the supply of the required amounts of cotton. The problem of unreliability in the supply of cotton to garment firms by the domestic economy has been exacerbated by the collapse of cotton ginning factories in Kenya. Thus, lack of raw materials that is required by most EPZ firms operating in Kenya has hampered the development

of strong material linkages between EPZ firms and the local firms.

4.3 Employment Creation

A major indicator of the success of an EPZ strategy is the number of jobs created. According to ILO (1998), EPZs have contributed positively to employment creation in countries such as China, Mexico and Mauritius. Mauritius stands out as a success story that has utilized the EPZ strategy in generating of jobs for her population. Employment within the Mauritius EPZs stood at 21,642 in 1980 and increased to approximately 90,861 in 1997, a 76 per cent increase in employment creation in a period of 19 years (ILO, 1998). The rapid job creating capabilities exhibited by EPZs in these countries has induced the establishment of EPZ programs in other countries. Kenya for example established its program in 1990, which has experienced mixed performance in terms of employment creation over the years (Figure 4.2).

Between 1993 and 1994 there was a 41 per cent increase in the number of jobs created (Figure 4.2). According to the EPZA officials it is the commissioning of the Athi River EPZ that led to an increase in the number of jobs created at that time. Between 1994 and 1996 growth of jobs created was very low at four per cent per annum because of the continuous mobility of firms in and out of the zones. It is at this particular time that the EPZ formula was being put to test in Kenya by several investors. Therefore, due to certain problems such as lack of market knowledge, rigid regulatory systems characterized by delays in clearance of imported inputs and capital goods, lack of required inputs and labor skills, small firms were unable to continue producing in the Kenyan EPZs hence the continuous entry and exit of firms within the EPZs in Kenya.

The number of jobs created between 1996 and 1997 declined by 10 per cent. The drastic decline according to the EPZA officials was occasioned by the footloose nature of the EPZ firms moving from Kenya to other countries. Relocation of firms was not only confined to EPZs but was a general trend affecting the whole country. Most foreign investors feared the pre- and post-election conflicts that were likely to adversely affect their operations in Kenya. During this particular time many workers were laid-off hence the general decline in employment levels.

Figure 4.2: Employment Creation Trends (1993 - 1999)
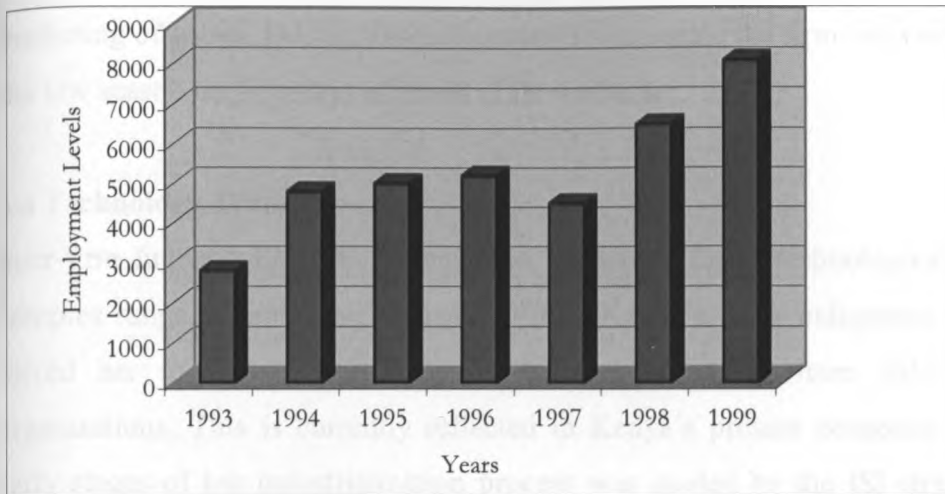
Source: Research Data/EPZA, 1993-1999.

Employment creation between 1998 and 1999 was very encouraging, increasing by 44 percent per annum. According to the EPZA officials, the rapid increase in the number of jobs created in a period of two years was due to the commissioning of two new zones in Kenya. Several new firms invested in these zones, which were mostly labor-intensive hence contributing to an increased number of jobs. Most of the operatives hired in these firms were Kenyans accounting for 98 per cent of the total employment in the EPZs.

Similarly, several studies which have been undertaken with a focus on employment creation argue that since most EPZ operations are labor-intensive they are potential job generators especially in Third World countries, however, due to high incidences of unemployment levels in most of these countries, coupled with the temporary nature of jobs in most EPZ firms it makes their impact on employment creation not easily realized (Warr, 1989; Knox and Agnew, 1989; South, 1990; Grunwald, 1991; Rhee *et al*, 1990; Kaplinsky, 1994; Sander, 1998; ILO, 1998). This has been the case for the EPZs in Kenya, where for example, unemployment levels stood at 2.7 million people in 1997, while in 1999 it was estimated at 6.5 million people, out of which the Kenyan economy is capable of creating only 240,000 jobs annually both in the formal and informal sectors (R.o.K, 1997, 1999, 2000). On average therefore, the EPZ program has been absorbing approximately 1000 workers annually since its inception in Kenya (Figure 4.2) which represents 0.4 percent of the total employment generated by EPZ firms. This is a very small and negligible proportion in a country faced with high levels of unemployment and in urgent need of creating jobs for her people. The other reason why the levels of employment creation have remained low within the EPZs is because of the use of casual labor by most EPZ firms. This is

very common in horticultural processing firms that are seasonal in their production and marketing of goods. During the high season for example the firm hires more workers and during the low season the firm lays off most of its workers.

4.4 Technology Transfer

Inter-firm linkages have the potential to encourage faster technological diffusion and a more complex range of products (Rothwell, 1986). Kenya's weak indigenous technological base has forced her to rely on external sources for technology from MNCs and foreign-owned organizations. This is currently reflected in Kenya's present economic structure whereby the early stages of her industrialization process was guided by the ISI strategy which meant that local industries relied heavily on imported capital goods for domestic processing and packing of finished goods (Leys, 1975). As a result the indigenous technological base has not grown.

Government policies emphasize technological development as the challenge and impetus for economic development and suggest that the logical route for Kenya is the transfer of technology from foreign to local investors, and from large to small enterprises through subcontracting relationships, partnerships and joint ventures (R.o.K, 1992). It is partly on this basis that the EPZs have been established in Kenya to attract foreign firms to invest in the country and act as avenues for technology transfer. Therefore, this study examines the technological transfer capabilities of EPZ firms with the host economy in terms of transfer of entrepreneurial, managerial and technical skills from the EPZ firms to the host economy. The EPZ firms are believed to posses a modernizing and transitional function and technology transfer capabilities through sub-contracting arrangements with domestic firms (World Bank, 1992; Cho, 1990).

4.4.1 Modernizing and Transitional Function

Experience shows that although EPZs are viewed as enclaves, their influence on the local economy is quite significant (South, 1990; Grunwald, 1991, ILO, 1998; Sander, 1998). The influence is essentially of a modernizing nature and exerts itself through a number of channels and mechanisms. The first channel and mechanism is the sheer visibility of the initial zone in a country. Because of its novelty, the zone and the first foreign firms established in it are observed very closely by the local community particularly by the domestic firms. This attention generates certain learning effects inside and outside the zone, especially in management techniques, organization of work and external market networks.

The manager of one of the EPZs claimed that its rapid success is based on management and *organizational skills borrowed from Sameer Industrial park, a pioneer EPZ in Kenya. Similarly,* Rafiki EPZ has managed to attract ten firms in a span of four years since its inception in 1997. Furthermore, the nature and type of firms investing in the EPZs has a bearing on the learning effects that can trickle down to the host economy. For instance, the first firms to locate in the four EPZs were predominantly foreign owned, but at the time this study was undertaken there were several joint ventures between the local and foreign shareholders. The processes and mechanisms in the movement of technology within and between the EPZs and the host economy are hypothetically illustrated in Figure 4.3. Due to continuous interactions between different *EPZs in the host economy, this leads to transfer of technology through movement of workers* between the zones. However, the learning effects between the EPZs are stronger than those between the zone and the host economy.

Figure 4.3: Movement of technology within and between zones and host economy.
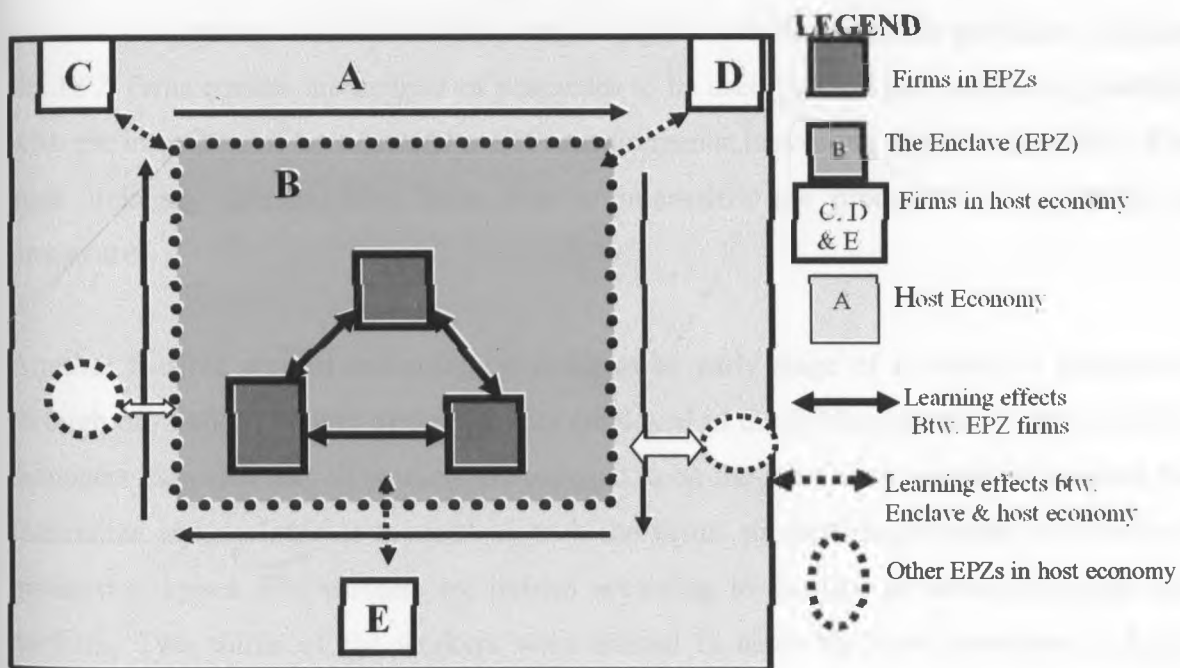
Source: Adapted from Corden 1974 and 1985.

Learning effects between different EPZs in Kenya are evidently shown by the success of Sameer *Industrial Park in terms of operation, management and set up which has been copied by zones* like Rafiki EPZ. However there have been weaknesses in the transfer of learning effects between EPZs and the host economy due to lack of integration of these zones within the host economy. *According to Warr (1989), the weaknesses in the transfer of learning effects between foreign*

and local firms within the EPZs and the host economy is explained by the fact that most foreign firms would wish to guard against their technology as a survival strategy.

Another important channel of technology transfer between the EPZ firms and the host economy is through material linkages. Due to the need for high quality inputs by firms, some EPZ firms provide extension services in quality control and upgrading of production techniques to their local suppliers. Through this process, domestic firms are able to improve their production techniques hence high quality products. Furthermore, workers employed in domestic firms are able to learn more about the new technology. However, this particular technology transmission channel has been very weak, due to weak material linkages between the EPZ firms and the domestic firms. Evidence from the field research indicate that only one fifth of the EPZ firms obtain most of their inputs from the host economy. Interviews with managers of the EPZ firms that source most of their inputs locally indicated that only one third have extension services with their local suppliers which is confined only to agro-based firms. In this particular arrangement, the EPZ firms control the amount of pesticides to be used by the local producers in compliance with the international horticultural market requirements, harvesting and quality control. Through such linkages, farmers have been able to internalize the production and quality control procedures.

Another feasible way of technology transfer at an early stage of a country's development is through on-the-job training of the workers employed in the EPZs. Interviews with the EPZ firm managers indicated that all workers are exposed to on-the-job training aimed at enabling them to internalize and acclimatize themselves with the firms' production processes in order to avoid production losses. The workers are trained according to the type of activity they are hired to perform. Two thirds of the workers were trained in assembly type operations and garment manufacturing while the rest were trained in management and technical work.

The duration of training workers depends on the nature of work to be performed. For example, the duration of training assembly line workers is always very short between one and three weeks and the workers are paid 60 per cent of their total salary. Most of the workers in these firms are trained in simple operations whereby the worker only knows part of the production process of a final product. For instance, in a bulb assembly firm a worker is trained in piecework like fixing the glasses on the bulb or soldering the base of the bulb. Hence, most of the workers on the assembly line of such firms are incapable of producing the entire product (e.g. bulb or battery)

on their own, an aspect referred to by Frank (1981) as "deskilling" of the labor force. This is a common phenomenon in the EPZ firms, which has denied most EPZ workers a complete knowledge of producing certain products on their own. The type of techniques and skills passed on to workers in the EPZs also vary with gender whereby men dominate jobs such as engineering, technical support, warehouse and transport management while women are confined to assembly type operations. According to Fernandez (1987), women are prevented from gaining access to jobs requiring technical expertise because of the organization of labor in the firms, traditional perceptions of women and industrial organizational structure in relation to women.

Apart from its modernizing and transitional functions, EPZs are viewed as viable instruments in partly facilitating the transition from a closed economy to a more open one. Thus, the function of an EPZ is not simply to produce new types of goods and services for the export or domestic market, but to serve as a transition mechanism from a closed to an open economy. The advantages associated with EPZs such as duty free importation of inputs and quick delivery systems are expected to trickle down according to Myrdal (1957) from the EPZ to the host economy. However, the trickle down effect between the EPZs and the host economy does not occur automatically. It needs time and commitment of the host economy in the sense that the host economy must be ready and willing to remove all protective barriers to stimulate a competitive production of the economy.

In Kenya for example the EPZs are seen as major instruments aimed at re-orienting the economy externally (R.o.K, 1986). According to EPZA officials, the EPZ formula stands out as a major strategy being used in Kenya to transform the economy from predominantly ISI to an EoI. The ultimate goal being to invigorate both domestic and foreign firms towards external markets. Evidence from this study indicates that by virtue of the EPZs having attracted local investors to manufacture for export, more firms are expected to follow the trend. In the final analysis this will translate the "trickle down effects" from the EPZs to the host economy. However, the process has been slow due to bottlenecks echoed by most firm managers who complained of rigid custom procedures and delay of inputs especially at delivery points.

4.4.2 Sub-Contracting Arrangements

Transfer of technology between the enclave and the host economy can also be transmitted through sub-contracting arrangements. The importance of sub-contracting arrangements is its improvement of the technical competence of the subcontractors. Sub-contracting helps mould more highly skilled entrepreneurs, a scarce and highly desirable factor in most LDCs especially in those, which the indigenous sector of the population hardly participates in industrial development (UNIDO, 1974; Warr, 1989; South, 1990; Sander, 1998).

From the study findings, two types of sub-contracting arrangements were observed amongst the EPZ firms. The first one involved the setting up of subsidiary firms within EPZs by foreign firms to act as assembly platforms. These production options are referred to as production sharing and outward processing (Sander, 1998). The study findings show that more than two thirds of the EPZ firms utilize production sharing and outward processing production options because they obtain assembly parts and product components from foreign companies for assembling into final products. The other type of sub-contracting arrangement involves EPZ firms subletting part of their manufacturing processes to firms in the host economy. Research findings indicate that only two firms sub-contracted part of their production processes to domestic firms. One was by a garment firm, which had sub-contracted an embroidery firm within the host economy to undertake embroidery work on its behalf. The other one was by a horticultural processing firm, which had a group of contract farmers to grow and supply the firm with the inputs. Therefore, technology can and has been transferred through such arrangements in the form of extension services and through technical upgrading of domestic firms sub-contracted by EPZ firms. However, due to the enclave nature of EPZ firms and domestic firms, such technological linkages have not been very significant.

4.5 Foreign Exchange Earnings

Determination of foreign exchange earnings was examined by use of the net export index and domestic spending by EPZ firms in the purchase of local inputs. The net export index refers to the total exports minus total imports. The study findings indicate that EPZ firms exported most of their products while importing a large proportion of their inputs and capital goods (Figure 4.4).

Figure 4.4: Trends in Exports, Imports, and Domestic Purchases 1995-1999 (Million Kshs)
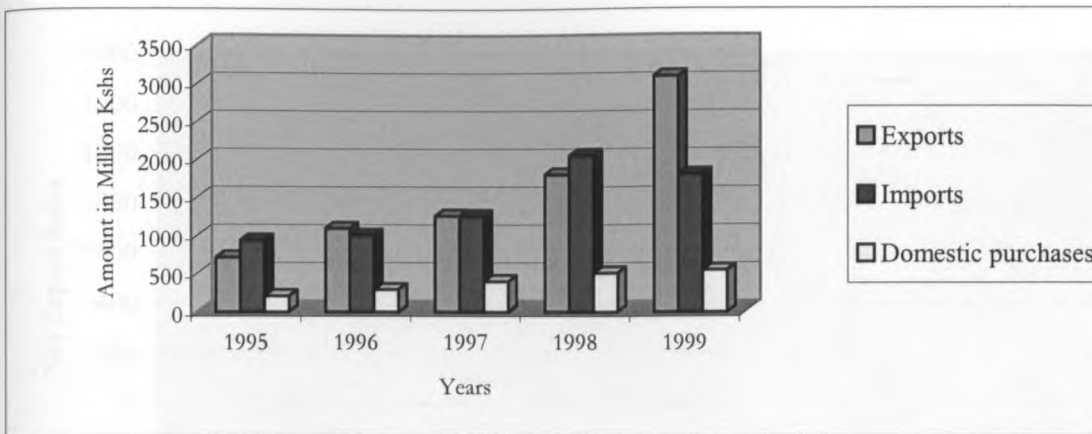
Source: Computed from EPZA Data, 2000

In 1995 for instance, imports were higher than exports and domestic purchases were very low. Interviews with the EPZA officials indicated that most firms were importing machinery and equipment in order to start production. In 1996, the amount used in the importation of inputs and capital goods was almost equivalent to the gains from the exports, while the domestic purchases were still very low. According to the EPZA officials, most firms had started operations and had started exporting their products. The situation was the same in 1997, but in 1998 there was an increase in imports compared to exports as most of the new EPZ firms imported capital goods. However, the scenario changed in 1999, whereby there was a rapid increase in exports as compared to imports. This scenario can further be illustrated by computing the net export index for EPZ firms in Kenya between 1995 and 1999 (Figure 4.5).

The net export index of EPZ firms in Kenya indicates that since 1995 up to 1999 imports have been much higher than exports This clearly shows that most EPZ firms in Kenya are import-cum-export types of processing zones. The amount spent on importation of inputs is higher than the amount gained (recovered) through exports of the final products. This shows that EPZ firms in Kenya have not fully developed backward and forward linkages with the host economy in terms of the purchase of industrial inputs.

Figure 4.5: Net Export Index (1995-1999)
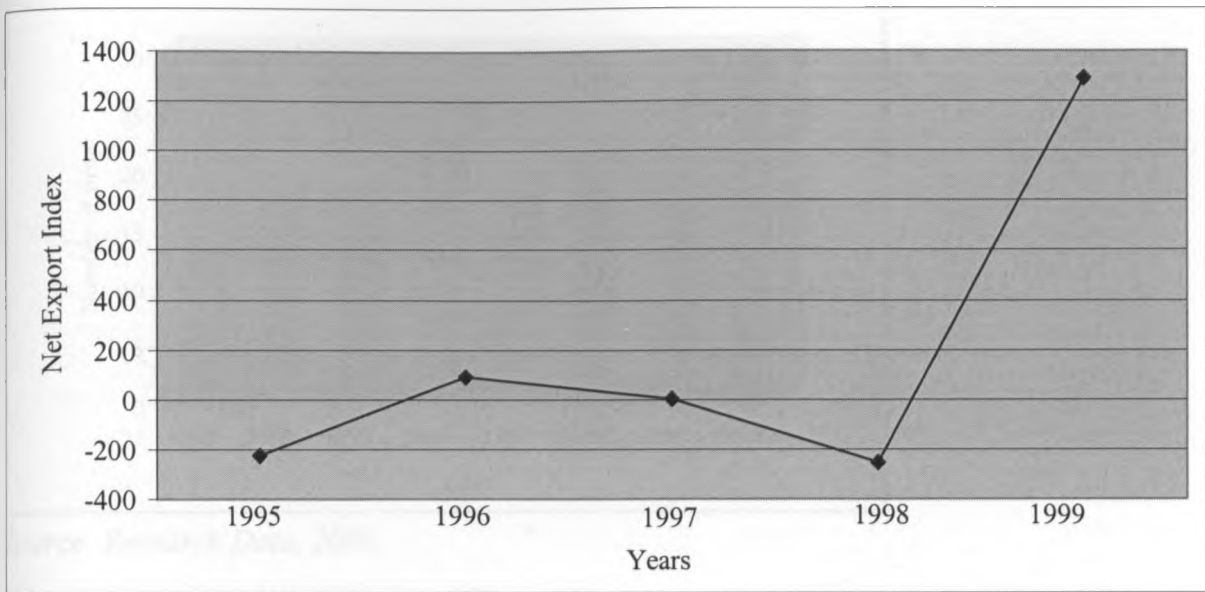
Source: Computed from EPZA Data, 2000

4.6 Capital Investment Flows

Since 1993, EPZs have attracted both local and foreign investors in manufacturing and service industries (Figure 4.6). For example in 1993 the number of firms investing in the EPZs increased modestly at a rate of 25 per cent per annum up to 1996. By 1997, there was a drastic decline in the total number of firms investing in the EPZs. According to the EPZA officials the number of firms declined from 22 in 1996 to 17 in 1997 due to the fear of pre- and post-election conflicts in the country. However, in 1998 the inflow of firms investing in EPZs picked up but at a low rate of 5 per cent to increase up to 18 firms. In 1999 the level of investment had improved by 22 per cent, while in the year 2000 it improved drastically by 37 per cent. With the advantages associated with African Growth and Opportunity Act (AGOA), more firms especially garment and textile firms are expected to invest in Kenya in order to enjoy the duty-free and no quota tariff while exporting to the US market. The low levels of capital investments within the EPZs are further explained by the locational mobility of EPZs firms (see section 4.7.1).

Apart from being instruments utilized in attracting scarce foreign direct investments, EPZs have been used as engines of regional development. The government has used the EPZ program to encourage manufacturing to move away from the more concentrated regions to regions with less industrial activities. For instance the public EPZ at Athi River has been instrumental in encouraging entrepreneurs to move away from the highly concentrated Nairobi's industrial area.

Figure 4.6: Firms that have invested in the EPZs Between (1993-2000)
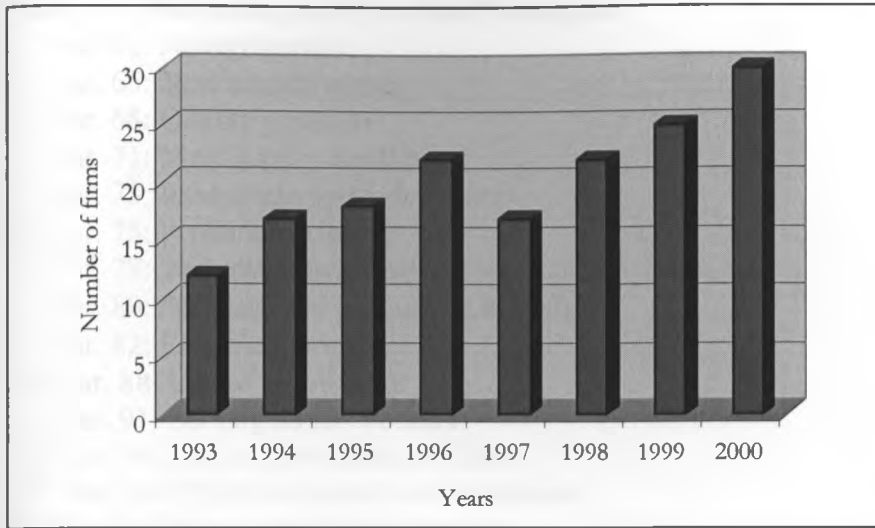
Source: Research Data, 2000.

4.7 Survival Strategies

This section examines the marketing and survival strategies utilized by EPZ firms in penetrating and remaining competitive on the world market. The hypothesis to be validated or rejected states that: There are no significant survival strategies utilized by EPZ firms in penetrating and remaining competitive in the world market. Factor analysis is employed to identify the most significant factors that EPZ firms utilize in penetrating and remaining competitive on the world market. EPZ firm managers were presented with a list of 18 strategies (Table 4.1). They were required to respond to them indicating whether they considered them very effective, effective, fairly effective, less effective or not effective. The responses on the 18 strategies are converted to a numerical scale as follows:

- Very effective   (V.E.)-1
- Effective   (E.)-2
- Fairly Effective (F.E.)-3
- Less Effective   (L.E.)-4
- Not Effective   (N.E.)-5

Having scored all the responses on a five-point scale, computation of the correlation matrix (Appendix 8) was done in order to identify whether the variables are related to each other. Since most of their correlations are fairly high (most of them are above 0.5) it is not necessary to perform a further test at this stage to determine the suitability of the data for factor analysis.

Table 4.1: Marketing and Survival Strategies

1. Var. 62: Advertisement
2. Var. 65: New market niches
3. Var. 68: Quality products
4. Var. 71: Meet supply deadlines
5. Var. 73: Production by tender/order
6. Var. 75: Product flexibility
7. Var. 78: Task differentiation
8. Var. 80: Standardized production system
9. Var. 82: Flexible labor force
10. Var. 88: Use of cheap labor
11. Var. 91: Set targets for workers
12. Var. 94: Use of non-unionized labor
13. Var. 100: Environmental consciousness
14. Var. 103: Use of youthful labor force
15. Var. 109: Rely on EPZ incentives
16. Var. 111: Search for quality inputs
17. Var. 113: Locational mobility
18. Var. 118: Technology upgrading

Source: Research Data, 2000.

The eigenvalues for the 18 survival strategy items were produced. The total variance can assist in deciding the number of factors needed to present the data. The total variance explained by each factor is listed in the column labeled eigenvalue (Appendix 10). The next column contains the percentage of the total variance attributable to each factor. For example, the linear correlation formed by factor one has a variance of 7.97, which is 44.9 per cent of the total variance of the 18 marketing and survival strategies. The last column of the cumulative percentage indicates the percentage of variance attributable to that factor and those preceding it in the table (Appendix 10). Thus, 83.6 per cent of the total variance is attributable to the first five factors. The remaining 13 factors, together account for only 16.4 per cent of the total variance.

Therefore, a model with five factors may be adequate to represent the data, since it fulfils the conditions of one of the criteria used in determining the number of factors. This criterion recommends that only those factors that account for variances greater than 1 (eigenvalue greater than 1) should be included. However, Tucker, Koopman and Linn (1969) state that in addition to selecting those variables with eigenvalues greater than 1, a scree-slope graph technique should also be employed. This technique is utilized in selecting the factors that fall above the cut-off point (Catell, 1978). Therefore, the scree-plot (Figure 4.7) identifies three factors for a detailed analysis. In the SPSS for windows, factor analysis procedure, the factor extraction criterion

based on eigenvalues and the percentage of total variance is the default criterion. This explains why further data analysis (Appendix 11 and 12) still maintains the five-factor model even though the three-model has been selected as the most suitable.

Figure 4.7: Factor Scree-plot
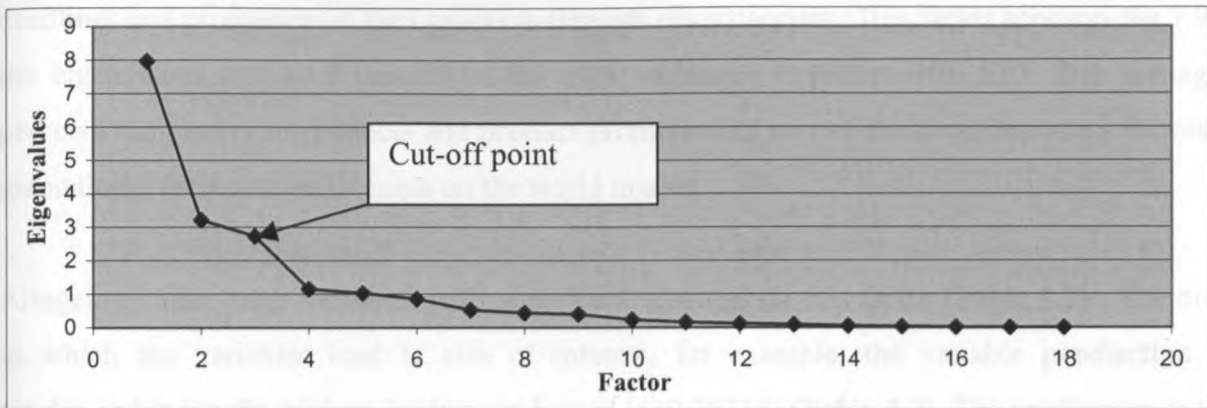
Source: Research data, 2000.

In order to assess how well the fitted-model reproduces the observed correlation, a residual matrix is generated. A residual matrix is simply the difference between the observed correlation co-efficient and that estimated from the model. If the residuals are small little above zero then the model fits the data well. Since the reproduced correlation matrix presented in (Appendix 9) shows that only 30 percent or 47 residuals with absolute values of greater than 0.05, the three-factor model indicated by the Scree-plot is adequate for the analysis.

The next procedure involves the rotation of the factors. This is to simplify the factor matrix (Appendix 11) by sorting out significant clusters of variables, without changing their relative positions. Rotation by means of the varimax method has the effect of emphasizing the stronger loadings and minimizing the weaker ones (Appendix 12). After rotation five factors with eigenvalues greater than 1.0 are extracted which together account for a total of 15.0 of the eigenvalues and 83.6 percent of the total variance in the input data matrix (Appendix 10). This analysis, however, limits itself to a three-factor model. To simplify the factor interpretation problem, the variables (Appendix 12) that have large loadings for the same factors are grouped together. Only those loadings with the highest absolute values (not less than 0.5) are chosen, this process is done for the first three variables (Table 4.2).

4.7.1 Data Interpretation

Factor one has been labeled **products and promotion**, because most of the variables that load highly on it have an element of quality products, quality inputs and market response. Most EPZ firms have managed to penetrate and remain competitive on the world market through production of quality goods, search for quality inputs, production by tender, meeting supply deadlines and promotion of their products through advertisement. This factor accounts for 7.9 of the eigenvalues and 44.9 percent of the total variance (Appendix 10). EPZ firm managers perceive the quality of products and product promotion as one of the most important factors in maintaining their competitiveness on the world market.

Altogether, there are 6 variables with significant loadings on this factor (Table 4.2). The order in which the variables load is also of interest, for example, the variable **production by tender/order** has the highest loading on Factor 1(+0.76714) (Table 4.2). The implication is that most EPZ firms produce goods on orders already placed from their consumers. This is based on the fact that most EPZ firms act as subsidiaries of parent plants. Thus, EPZ firms mainly engage in the final production of goods that are later shipped to their marketing agents or parent plants for marketing. **Product flexibility** is another variable with a high loading on Factor 1(+0.72473). Product flexibility is the ability of the firm to change the design of the product depending on consumer tastes. Since consumer tastes are the driving force towards the success of manufacturing firms in maintaining their competitiveness, close monitoring of consumer responses has become important in the geography of manufacturing. Therefore, whenever consumer tastes change, firms must be prepared to follow the trend. Thus, EPZ firms especially garment manufacturing firms are always changing fashions and designs of their products to meet consumer demands.

Meeting supply deadlines with a loading of (+0.72319) is another key strategy utilized by the EPZ firms in maintaining their competitiveness. Competition to supply the world market means constant pressure to reduce costs and meet deadlines. The EPZ firms achieve this by making further use of shifts, increasing working hours and number of workers on production lines. This intensity is increased when particular production deadlines have to be met which means that workers may be kept in the factory until the order is complete. Production of **quality goods** and **search for quality inputs** are also very significant strategies with loadings of (+0.70658) and (+0.68316) respectively on Factor 1. Due to the need for the EPZ firms to manufacture quality products, there is a continuous search for quality inputs. There is a general fear by the EPZ firms

that entire shipments of finished goods may be rejected if the raw materials or intermediate goods used are of inferior quality. Employees on assembly lines are also trained to check the quality of goods before being packed for export.

The last variable with a high loading on Factor 1(+0.57734) is **advertisement**. Advertisement is one of the major promotional procedures utilized by EPZ firms in marketing their products. The traditional view of advertising is that it persuades people to buy a firms' product hence increasing its market power. Some of the channels through which EPZ firms advertise their products include trade exhibitions and media. However, parent plants or marketing agents on behalf of the EPZ firms undertake most of the advertising and search for buyers.

Factor 2, which accounts for 3.2 of the eigenvalues and 16.3 per cent of the total variance, is labeled **labor-cum-product standardization** (Table 4.2). It has five significant loadings. The variable **product standardization** has the highest loading on Factor 2 (+0.91184). Product standardization in the context of EPZ firms is understood to refer to mature products. Since most EPZ firms engage in labor-intensive types of products, search for abundant cheap labor is a very important survival strategy for most EPZ firms. Thus, it is not surprising that aspects of labor load very highly on Factor 2. These are **youth-full labor force** (+0.83396), **cheap labor** (+0.78793), and **flexible labor force** (+0.72354) (see chapter 3 section 3.9.1). **Setting targets for workers,** which also loads highly on Factor 2(+0.65091) stands out as a major survival strategy for most EPZ firms. To be able to meet supply deadlines, EPZ firms set targets for their workers. For instance, in a bulb and battery firm, workers were expected to produce a set number of products in order to earn a day's wages. Interviews with workers indicated that in a normal working day one was required to produce a total of 4,000 bulbs. Garment manufacturing firms also had set targets to be achieved by workers. Furthermore, firm managers usually increase the number of working hours (see chapter 3 section 3.9.2) in order to meet supply deadlines.

Table 4.2: Factor Analysis Results of Marketing and Survival Strategies for EPZ firms

Factors	1 Products and Promotion	2 Labor-cum-product standardization	3 Locational mobility-cum-incentives
% of additional variance explained	44.9%	16.3%	10.6%
Variables with significant loadings	♦ Production by tender or order (+0.76714) ♦ Product flexibility (+0.72473) ♦ Meet supply deadlines (+0.72319) ♦ Quality products (+0.70658) ♦ Quality inputs (+0.68316) ♦ Advertisement (+0.57734)	♦ Product standardization (+0.91184) ♦ Youthful labor force (+0.83396) ♦ Cheap labor (+0.78793) ♦ Flexible labor force (+0.72354) ♦ Set targets for workers (+0.65091)	♦ Locaional mobility (+0.88795) ♦ Non-unionized labor (+0.70842) ♦ EPZ-incentives (+0.60227)

Note: The results presented in this table have been extracted from Appendices 2 and 4. (n-25)
Source: Research Data, 2000.

Factor 3, which accounts for 2.7 of the eigenvalues and 10.6 percent of the total variance, is labeled **locational mobility-cum-EPZ incentives** (Table 4.2) and has three significant loadings. The variable **locational mobility** has the highest loading on Factor 3 (+0.88795) (Table 4.2). For EPZ firms to maintain their competitiveness, they are continuously in search of low cost production regions. Therefore, due to their footloose nature they can easily move from one region to the other depending on the cost of production. Their footloose nature is enhanced by the fact that most EPZ firms are either small or medium sized firms with very modest capital investments. The EPZ formula also provides these firms the advantages of ready industrial buildings into which they can invest easily and relocate at will. The other variable with a high loading on Factor 3 (+0.70842) is labeled **non-unionized labor** because three quarters of the EPZ firm managers claimed that they are afraid of labor unions. For instance, the study findings indicate that within the EPZs trade unions are strongly discouraged which is seen as an advantage to firms in these zones. EPZ firms, therefore, utilize such advantages to exploit workers by overworking them and paying them low wages.

Lastly **EPZ incentives** is another significant variable with a high loading on Factor 3 (+0.60227) (Table 4.2). Due to availability of incentives, EPZs enable investors to: reduce the cost of production; minimize delays in entry and exit of goods; reduce the risk of offshore ventures; and meet delivery schedules through just-in-time delivery systems and outward processing.

4.8 Summary

This chapter aimed at determining whether EPZ firms have significant linkages with the host economy and whether EPZ firms have significant strategies utilized in maintaining their competitiveness on the world market. The major aspects examined are material linkages, employment creation, technology transfer, foreign exchange earnings, foreign investment flows and marketing and survival strategies.

Using descriptive statistics and other indicators in the analysis of linkages, the findings indicate that EPZ firms have not developed strong linkages with the host economy. The paucity of linkages between EPZ firms and the host economy is due to their enclave nature. This has hindered their integration into the host economy, hence acting as an obstacle to the development of both forward and backward linkages. The inability of domestic firms to forge backward and forward linkages with EPZ firms is exacerbated by their dependence on external inputs. Furthermore, due to the collapse of the local textile industry in Kenya, the domestic firms cannot reliably supply the EPZ firms with required inputs. Finally, EPZ firms in their effort to maintain their international mobility, have not developed strong backward linkages with domestic firms. Linkages were only observed within EPZ firms utilizing agro-based inputs sourced directly from domestic producers and suppliers.

Due to the labor intensive nature of the garment-manufacturing firms, they have had some positive impact in terms of overall employment creation. Although the jobs created directly or indirectly, are mainly in the unskilled or semi-skilled occupations, they are far from negligible. However, in general due to their international footlooseness, EPZ firms have not contributed significantly to employment creation in Kenya.

Other contributions to the growth and the development of the domestic economy, such as the training of skilled labor or technology transfer have also not been very significant because most EPZ firms engage in simple assembly operations devoid of R&D. The other forms of technology transfer that arise from subcontracting arrangements have not been very significant due to the paucity of backward linkages between EPZ firms and domestic firms. Foreign exchange earnings generated from EPZ firms have not been very significant. This is so because salaries paid to local workers are very low, most EPZ firms depend on imported inputs and EPZ firms are exempted from paying taxes. The findings also indicate that although the EPZs have managed to attract both foreign and local investors this has not been very significant due to the

mobile nature of firms and low levels of investments. The study findings further indicate that the EPZ firms rely on certain survival strategies, which enable them to penetrate and remain competitive in the world market. Therefore, the null hypothesis that: "There are no significant linkages between EPZ firms and the host economy" cannot be rejected, while the null hypothesis that: "There are no significant strategies utilized by EPZ firms in penetrating and remaining competitive in the world market" is rejected.

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study was guided by three major hypotheses:

- There are no significant differences in the structural characteristics of EPZ firms;
- There are no significant linkages between the EPZs and the host economy; and
- There are no significant survival strategies utilized by EPZ firms in a competitive world market economy.

5.2 Summary of Major Findings

The major activities undertaken within EPZs are garment manufacturing and assembly operations with the main products being garments and computers. Most firms in the EPZs depend on imported inputs in the manufacture of products mainly for export. These firms mostly manufacture mature products characterized by simple operations and dependent on low-level technology and high labor content. In terms of firm size, most of them fall under the small and medium category according to their levels of investment and number of operatives. However, EPZ firms with large amounts of capital invested in machinery employ a small number of operatives, while those firms with low levels of investments are inclined towards hiring large numbers of operatives.

Labor attributes and the general working conditions in EPZs are quite similar in all the firms. One of the most distinctive features of EPZs observed is the high proportion of women in the workforce especially in the garment industries. The EPZ firms have very unsafe and strenuous working environments where workers are exposed to excessive heat, noise and dust. Furthermore, most of the workers in the EPZ firms work for longer hours, are not entitled to overtime allowances and leave. Similarly, since most workers are hired on either casual or contractual basis they lack job security.

The multiplier effects of the EPZs with the host economy have also been weak. The EPZ program in Kenya has not lived upto the expectations of many. Employment in the EPZs has not been very significant as evidenced by the small number of operatives engaged in the firms. The number of people hired by EPZ firms has been shrinking due to the footloose nature of firms and their continuous dependence on casual labor. However, with the advantages associated with African Growth and Opportunity Act (AGOA), more firms especially garment and textile-

manufacturing firms are expected to invest in the Kenyan EPZs, hence creating more jobs. Transfer of technology has been hampered by several factors, such as weak forward and backward linkages and reliance by most EPZ firms on simple production technologies. Backward and forward linkages have not been achieved due to over-dependence of EPZ firms on foreign inputs and external markets. However, one source of hope for strengthening backward linkages is the agro-based processing firms, which source most of their inputs from domestic suppliers. Foreign exchange earnings have also been very low because the EPZ firms import most of their inputs, lack subcontracting arrangements with domestic firms, and repatriate profits. The EPZ firms are also seen to be responsive to the competitive nature of the world market by adopting certain survival strategies. The major survival strategies utilized by most EPZ firms in a competitive world market economy are production of quality goods, use of cheap non-unionized labor, standardization of production processes, locational mobility, and the advantages associated with the EPZ incentives.

5.3 Conclusion

Based on the findings from this study, the EPZs can be referred to as new industrial spaces in Kenya because they exhibit similar evolutionary and structural characteristics. Similar to the transition from fordism to post fordism and the resultant new industrial spaces in North America and Western Europe, the evolution of EPZs in Kenya has followed the same trajectory path. For instance the transition from ISI to EoI strategies in Kenya has led to the establishment of EPZs aimed at reorienting the economy externally. In terms of the structural characteristics, most EPZ firms are foreign-owned, are dependent on labor intensive technology, rely mostly on imported inputs, are mostly export-oriented, manufacture mature products and most are either small or medium in terms of size. The EPZ firms in Kenya also exhibit similar survival strategies aimed at maintaining their competitiveness in the world market economy. Thus the regulation approach has proved to be a very reliable approach in understanding the EPZs as new industrial spaces in Kenya

This study further indicates that the industrial structure has a bearing on the nature and type of the multiplier effects that develop between different firms in a region. It is through their enclave nature that the EPZs have not had positive multiplier effects with the host economy. This is evidenced by the low employment levels, minimal backward linkages and low levels in the foreign exchange earnings of the EPZ firms in Kenya.

5.4 Recommendations

This research has shown that part of the task facing policy makers and scholars is to assess the EPZ strategy in an effort to come up with viable solutions to make it benefit host economies. Therefore, to make the EPZs a viable industrial development strategy in Kenya the following measures need to be considered:

- The government needs to put in place measures whereby industries with strong backward linkages should be encouraged to invest in the EPZs. Furthermore, additional incentives and/or exemptions could be offered to foreign companies willing to purchase a portion of their inputs from the host economy.
- Domestic firms need to be sensitized on the need and importance of manufacturing quality goods that they can be able to sell to EPZ firms.
- The government needs to put in place aggressive measures to revamp the textiles industry in order to forge backward linkages with EPZ firms utilizing textile related products.
- EPZ firms need to be given incentives in order to maintain their workforce for extended periods of time or to upgrade the skills of the workers beyond the level of direct production.

5.5 Future Research Recommendations

In the course of conducting the research for this study a number of interesting aspects emerged, but which could not be covered. These are outlined as follows:

- The scenario in the Kenyan EPZs after the expiry of the 10-year tax holiday.
- Modes of integrating the EPZs into the Kenyan economy.
- The implications of the over reliance of most firms on youthful female labour.
- The impact of AGOA on EPZs in Kenya.

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Appendix 1: List of Export Processing Zones

Zone	Name of Firm	Products	Year of Establishment
1.Rafiki EPZ	Indigo Garments	Garments	1999
	CEVA (SANOFI)	Pharmaceuticals	1997
	Bright Light	Bulbs & Battery	1999
	Kenyava Web Design	Computers	1997
	Insight Digital	Bill boards	2000
	Computer mapping	Computers	1998
	Kingtake	Garments	1999
	Millenium	Computers	2000
2.Sameer Industrial Park	Legend Technologies	Computers	1994
	J.A. R. LTD.	Garments	1997
	Rosavie	Dried flowers	1998
	Wes Export	Fruit packaging	1995
	Rayven	Paper manufacture	1996
	Indu-Farm	Horticultural processing	2000
3.Thomas De La Rue EPZ	De La Rue Security Prints	Currency and Security Documents	1993
4.Athi River EPZ	Ivee Aqua	Pharmaceuticals	1995
	Tri-Star	Garments	1995
	Nodor Kenya	Darts boards	1999
	Eltex	Cotton yarn	1995
	Norbrook Africa	Pharmaceuticals	1995
	Lureflash	Fishing hooks	1999
	New-cal	Computers	1999
	Far-East Technologies	Computers	2000
	Transfleet	Construction	1993
	First manufacturing	Garment	1995

Source: Research Data, 2000

APPENDIX 2: FIRM QUESTIONNAIRE

This is a study being carried on the Export Processing Zones in Kenya. The study aims at obtaining information on the nature and operation of EPZ firms in Kenya. Your co-operation will be highly appreciated. The information acquired in this survey will be treated as strictly confidential and will be used for academic purposes only.

1.0 Name of firm/Establishment ....   Name of EPZ (Where located).........................

1.1 Position of the respondent

      (01) Managing Director   ☐   (02) Personnel Manager   ☐

      (03) Public Relations Manager ☐   (04) other (Please specify).....................

1.2 When did your firm begin operating in the EPZ in Kenya?   In 19..............

1.3 Where was firm located before coming to this zone? (State the country and town).......................................

1.4 What attracted you to locate in this particular EPZ? (Tick where appropriate)

      (01) Quality infrastructure   ☐

      (02) Ready built factory houses   ☐

      (03) Quality services   ☐

      (04) Nearness to the major transport networks ☐

      (05) Others (Please specify).........................

1.5 Have you rented this space? (01) Yes   (02) No

1.6 Approximately how much do you pay as rent? In Kshs

(I) STRUCTURAL CHARACTERISTICS

1.7 State the nature of ownership of your firm based on the categories (Tick where appropriate)

(01) Foreign owned   ☐ (02) Locally owned   ☐   (03) Joint venture ☐

1.8 If foreign owned please state

      (01) The name of the parent plant...

      (02) The country of origin ....

      (03) Other countries where there are subsidiaries?...

1.9 What does this firm engage in?

    (01) Manufacturing (02) Service (03) Others (Please specify)..............

2.0 Which products and or services is your firm engaged in? (Please name them)................

....

2.1 Please indicate the sources of your raw materials and inputs

    (01) Local sources

    (02) Foreign sources

    (03) Both

2.2 If local sources fill this table

Name of inputs	Name of supplier in Kenya

2.3 If foreign sources fill this table

Name of inputs	Country of origin

2.4 Based on the sources of inputs rank them by percentages

  (01) Local inputs............ (02) Foreign inputs...............

2.5 Why do you prefer inputs from the named sources? (Multiple answers allowed)

(01) Reliability (02) Quality   (03) Affordability   (04) Need for uniformity in products

(05) Recommended by the parent plant (06) Other (please specify)

2.6 Which machines /implements does your firm utilize? (Please name them)

(1)   (3)

(2)   (4)

2.7 For each machine name the source of origin

No	Name of machine	Purpose	Local supplier	Foreign (country)

2.8 How many people are employed in this firm? (Give the total numbers of the workers)

Work category	Number of Workers
Management	
Supporting staff	
Assembly line (machine operators, supervisors, technicians e.t.c)	

2.9 How are the workers distributed on the assembly line in terms of gender?

(01) Men   (02) Women

(II) LINKAGES WITH THE LOCAL ECONOMY

3.0 Name markets of your goods and services

Product type		Markets /destinations			
Manufactured goods	Services	Local market	Tons/Kshs	Foreign markets	Tons/Kshs

3.0What percentage of goods are you allowed to sell on the local market? Percentage...................

3.1 Enumerate some of the problems faced by your firm while marketing its products (On the world market and the Kenyan market)..

....

3.2 Does your firm purchase inputs and intermediate products from Kenyan firms and suppliers?   (01) Yes   (02) No

3.3 If yes, fill this table

Type of firm/supplier in Kenya	Types of goods/inputs supplied

3.4 If no, explain why you do not source goods from the Kenyan suppliers?

....

....

....

3.5 Fill this table to show the services your firm receives from the Kenyan firms

Services from the Kenyan economy	Name of firm or supplier
Security	
Banking	
Transportation	
Clearing and forwarding	
Packaging materials	
Insurance	
Telecommunications	
Waste disposal	
Stationery and office equipment	
Legal affairs	
Other (please specify)	

3.6 Do you put out part of your production processes to other firms in Kenya?   (01) Yes   (02) No

3.7 If yes, please fill them in this table

Name of firm sub-contracted	Services and production sub-contracted

3.8 Is your firm in any manner requested to produce goods and services for firms in the local economy (in Kenya)   (01) Yes   (02) No

3.9 If yes, name types of jobs sublet to your firm.

....

....

4.0 Do the workers need some technical know-how in order to operate the machines in this firm? (01) Yes   (02) No

4.1 Where are they trained?

  (01) On-the-job training (02) In technical schools in Kenya   (03) Trained abroad

  (04) Other (please specify)

4.2 How many workers have you trained so far? (Based on the categories)

Position	No. Trained	Nature of work trained to perform
Technicians		
Supervisors		
Management		
Machine operators		
Assemblers		
Packers		
Quality controllers		
Other (please specify)		

4.3 How many workers have you employed based on the categories?

 (01) Local employees (No.   ) (02) Expatriates (No.   )

4.4 In the process of exporting final products and/or importing inputs do you pay taxes?   (01) Yes   (02) No

4.5 If yes fill this table

Goods exported in tons	Amount paid in taxes or service charge	Goods imported in tons	Amount paid in taxes or service charge

4.6 Please show the amount of capital you have invested in the EPZs since the time you started operating.

Total investment in Kshs	Type of machines and implements in your firm	Other items

(III) SURVIVAL STRATEGIES

4.7 Which strategies do you utilize in marketing your products on the world markets? Select the strategies commonly utilized by your firm and rank them as 1.Most effective 2. Effective 3. Fairly effective 4. Least effective 5 Not effective

Strategies/Procedures	Rank				
	1	2	3	4	5
(01) Through advertisement					
(02) Product promotions					
(03) Market research					
(04) Through production of quality goods					
(05) Production by order					
(06) Appointing salesmen in the countries of export					
(07) Meeting supply deadlines					
(08) By being price competitive					
(9) By locating in countries less affected by QUOTA Systems					
(10) Other (Please specify)					

4.8 Through which channels do you advertise your goods/services on world markets?

Form of advertisement/channel	Its effectiveness in the export of goods

4.9 Which procedures do you use in satisfying consumer choices? (Enumerate them)...........................
....

5.0 Do you produce by order/ tender? (01) Yes   (02) No

5.1 If yes, where do your orders come from? (State the country)

5.2 Do you produce intermediate goods to be used by other firms for their final production?   (01) Yes   (02) No

5.3 If yes, fill this table

Intermediate products	Firm or country supplied to	Their end use

5.4 Which strategy do you utilize in selling your products competitively? (Multiple answers applicable)

   (01) Charging low prices in comparison to other producers of the same product.

   (02) Giving discount to buyers

   (03) Reducing costs of production to reduce prices

   (04) Other (Please specify)

5.5 Which problems does your firm experience when exporting products on the world market?

....
....
....

5.6 What do you do with the products, which do not meet the international market standards? (Please explain)

....

5.7 Do you experience stiff competition from other producers of the same product on the world market?

    (01) Yes   (02) No

5.8 If yes, fill this table

Name of your competitor (firm)	Country of origin	Products/services

5.9 Which strategies does your firm utilize in remaining competitive on the world market (Rank them in their order of effectiveness to your firm e.g **1. Very effective 2. Effective 3. Fairly effective   4. Least effective 5 Not effective**

Strategies	Rank					Decision maker	
	1	2	3	4	5	Local firm	Parent plant
Through automation (use of computerized production systems)							
Use of standardized production systems							
Use of cheap non-unionized labor							
Relocating to other zones with low production costs							
Putting out certain product processes to other firms							
Through production sharing (produces part of the product)							
By technology upgrading to keep with production changes							
Use of temporary labor force (casuals)							
Conscious of consumer tastes (fashions)							
Performing market research (search for new markets)							
Meeting supply deadlines							
Use/search for cheap and reliable suppliers of inputs							
By locating in EPZ s (with incentives)							
Other (Please specify)							

(IV) LABOR CONDITIONS

6.0 What is the employment structure in this firm ?

Workers category	No.	%	Description of work
Casuals			
On contract			
Permanent			
Other (specify)			

6.1 Why do you prefer the above named category?

   (01) Can be laid off at any time   (02) Cheap to manage

   (03) Non-militant and powerless   (04) Reduces production costs   (05) Others (Please specify)

6.2 Which criterion is used in paying the workers?

Description	Items	Hours worked	Duration of pay	Amount per Hr/Day
(a) Amount of work done (Target e.g. how many items per hour or day)				
(b) Time/period worked (Hours/Days)				
(c) Based on experience				
(d) Based on the labor regulations				
(e) Other (Please specify)				

6.3 After how long do you pay the workers?

   (01) Month   (02) Two weeks   (03) Daily   (04) Other

6.4 What is the labor distribution in this firm in terms of age and sex?

Women		Work description	Men		Work description	Children		Work description
No.	%		No.	%		No.	%	

6.5 Why do you prefer the above type of labor force? (Please explain)

6.6 What do you do with workers who fail to meet production targets? (Please explain)

....

....

6.7 What are some of the benefits that your firm provides to workers? (Multiple answers allowed)

    (01) House allowance   (02) Medical allowance   (03) Overtime Allowance

    (04) Traveling allowance   (05) Risk/accident allowance   (06) Other (Please specify)

6.8 Do you provide your workers with safety gadgets while at work/assembly line? (01) Yes (02) No

6.9 If yes, please name them. ....

....

7.0 Are your workers members of any social security scheme? (01) Yes   (02) No

7.1 If yes, please name them..

7.2 If no, explain why they have not joined any...

....

7.3 Do you allow your workers to join labor unions? (01) Yes   (02) No

7.4 Do you give your workers leave? (Fill as per the categories below

    (01) Casuals   (01) Yes   (02) No

    (02) Permanents   (01) Yes   (02) No

8.6 If yes, how do you pay them for the days on leave? (Please state the amount and the days given for leave)

APPENDIX 3: EMPLOYEES/WORKERS QUESTIONNAIRE

1.0 Place of interview (Please specify the name of the firm)..........................

1.1 Position of the respondent

        (01) Supervisor □   (02) Technician □   (03) Assembly line worker   □

        (04) Machine operator   □ (05) other (Please specify)................

1.2 Sex   (01) Male □   (02) Female □

1.3 Age...............

1.4 Level of Education   (01) Primary level □   (02) Secondary level   □
  (03) Polytechnic/Technical College   □   (04) University   □
  (02) Other (Please specify).......................

1.5 When were you employed in this firm? 19........

1.6 Which work do you perform in this firm? (Please state it and give its description)...........................

1.7 Which qualifications does the firm require to recruit you for this work you are doing?
(01) Technical knowledge   (02) Age   (03) Sex   (04) Level of education   (05) Others (Please specify)

1.8 Do you encounter difficulties while performing your work in this firm? (01) Yes   (02) No

1.9 Please name some of the difficulties...

2.0 Have you been trained by this firm for the work you are doing? (01) Yes □   (02) No □

2.1 If yes, where were you trained? (Tick where appropriate)
        (01) On-the-job training □   (02) Kenya Technical Schools for training □
        (03) Abroad for training □   (04) other (Please specify).........

2.2 Apart from this firm, where else have you worked? (Please name the firm, the type of work you were doing and the year of departure)

2.3 Which job were you doing in the previous firm?...

2.4 Why did you move from the other firm to this one? (Tick where appropriate)
        (01) Low salary package   □   (02) Poor working conditions   □
        (03) Retrenched   □   (04) Fired   □
        (05) Other (Please specify)

2.5 How do you perceive this particular work you are doing? (Tick where appropriate
        (01) Boring and repetitive   □   (02) Tiring   □   (03) Simple   □
        (04) Dangerous to your health □   (05) Difficult and demanding   □
        (06)Others (Please specify)

2.6 How do you benefit from this particular firm? (Tick where appropriate)
        (01) Training   □   (02) Good salary package   □
        (03) Conducive working conditions   □   (04) Traveling allowance   □
        (05)Medical allowance   (06) House allowance
        (07)Risk allowance   (08) None of the above

2.7 What is your employment contract? (Tick where appropriate)
        (01) As a part-time worker (casual)   □   (02) As a full-time worker   □
        (03) On a contract basis   (04) Others (Please specify)

2.8 Which criteria do this firm use in paying your salary? (Tick where appropriate)
        (01) Amount of work done □   (02) Number of hours worked □   (03) Others (Please specify)

2.9 If it is in terms of amount of work done, please explain how much you have to do and how much you are paid (For example based on the number of items produced and the rate of payment per item)

3.0 If it is in terms of number of hours worked, please indicate by ticking where appropriate as per the categories below
(01) Monthly ☐ (02) Weekly ☐ (03) Daily ☐ (04) Hourly ☐

3.1 Indicate the amount of money you receive using the categories below (all in Kshs)
(01) 500 - 1500 ☐ (02) 1500 – 2500 ☐ (03) 2500- 3500 ☐ (04) 3500- 4500 ☐
(05) 4500 - 8000 ☐ (06) 8000 – 10000 ☐ (07) 10000-12000
(08) 12000 and above

3.2 Where do you stay? (Explain where and how far it is from this firm)

3.3 How do you commute? (Tick where appropriate)
(01) Personal car ☐ (02) Matatu ☐ (03) Bicycle/ Motorcycle ☐ (04) Walking ☐
(05) Other (Please specify)

3.4 How many hours are you expected to work in a day? Hours.

3.5 Do you ever get a leave? (01) Yes ☐ (02) No ☐

3.6 Are you paid for the days you are on leave? (01) Yes ☐ (02) No ☐

3.7 If yes, at what rate are you paid? (Tick where appropriate)
(01) Normal salary☐ (02) Half the salary ☐
(03) Other (Please specify)..0

3.8 Are you provided with safety gadgets while at work? (01) Yes ☐ (02) No ☐

3.9 If yes, please name them...

4.0 Does your employer insure you against factory accidents? (01) Yes (02) No

4.1 If yes explain how..
....
4.1 Are you a member of any social security scheme? (01) Yes ☐ (02) No ☐

4.2 If yes, tick where appropriate,
(01) National Social Security Fund ☐
(02) National Hospital Insurance Fund ☐
(03) Others (Please specify)

4.3 Who sends the contributions? (Tick where appropriate)
(01) The firm pays for me but does not deduct from my pay ☐
(02)The firm pays but deducts from my pay ☐
(03) Others (Please specify)...

4.4 Are you a member of any labor union? (01) Yes ☐ (02) No ☐

4.6 If yes, specify which one

4.7 If no, explain how you bargain for higher pays and how you press for other benefits from this firm.

APPENDIX 4: EPZA QUESTIONNAIRE

1.0 Position of the respondent

      (01) Managing Director   □

      (02) Personnel Manager   □

      (03) Public Relations Manager   □

      (04) Other (Please specify)

1.1 Please show and explain how the EPZA is linked to each the following EPZs

      (01) Athi River EPZ..

      (02) Sameer Industrial Park..

      (03) Rafiki EPZ ....

      (04) Thomas De La Rue EPZ..

1.2 What are the major terms and conditions given to firms that would like to invest in the EPZs? (Tick where appropriate)

      (01) Production for exports   □   (02) Employment creation   □

      (03) Purchase of local raw materials □   (04) Training   □

      (05) Other (Please specify)

1.3 What has been the contribution of each EPZ? (Fill the table)

ZONE	Capital investment	Employment levels	Number of firms
Athi River			
Sameer			
Rafiki			
Thomas De La Rue			

1.4 Can you please enumerate the strategies used by your agency (authority) in marketing of EPZs to the investors

1.5 Where does your authority get funds to run its operations?..
....

1.6 Do some goods manufactured by firms in the EPZs find their way back in to the local market?

      (01) Yes □   (02) No □

1.7 If yes, what does your authority do to overcome this problem? (Please specify how).

1.8 Why do you think such goods find their way back to the local markets?..
....
....
....

1.9 Could you please enumerate the problems that you encounter in running the EPZs in Kenya?

2.0 How can such problems be solved to make EPZs a successful strategy in Kenya?

APPENDIX 5:   EXPORT-PROMOTION COUNCIL QUESTIONNAIRE

1.0 Position of the respondent

    (01) Managing Director   ☐   (02) Personnel Manager   ☐

    (03) Public Relations Manager ☐   (04) other (Please specify)

1.1 When was this institution established in Kenya? In 19…………..

1.2 Is your institution in any way linked to the EPZs in Kenya?   (01) Yes ☐   (02) No ☐

1.3 If yes, how is it linked to each the following EPZs?

    (01) Athi River EPZ……………………………………………………………………………………………

    (02) Rafiki EPZ………………………………………………………………………………………………

    (03) Thomas De La Rue EPZ………………………………………………………………………………..

    (04) Sameer Industrial Park……………………………………………………………………………………

1.4 How many firms have passed through your institution to locate in the EPZs? (Please give the number and the names)

Name of firm	Year of investment	Country of origin	EPZ where located

1.5 What has been the contribution of EPZs to the Kenyan economy? (Fill the table)

Year	Exports from EPZs		Total exports from Kenya	
	Tons	Kshs	Tons	Kshs
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				

1.6 How does your institution encourage or assist in the marketing of EPZs to potential investors?

………

………

1.7 What do you think should be done to make EPZs a viable instrument for promoting production for export in Kenya? (Please enumerate them and explain how each can be achieved)

APPENDIX 6: INVESTMENT PROMOTION COUNCIL QUESTIONNAIRE

1.0 Position of the respondent

    (01) Managing Director   ☐   (02) Personnel Manager   ☐

    (03) Public Relations Manager   ☐   (04) other (Please specify)

1.1 When was this institution established? In 19

1.2 Is your institution in any way linked to the EPZs?   (01) Yes ☐   (02) No ☐

1.3 If yes, please explain how it is linked to these four EPZs?
    (01) Athi River EPZ..

    (02) Rafiki EPZ...
    (03) Thomas De La Rue EPZ...
    (04) Sameer Industrial Park ....

1.5 How many firms have through the institution?

Name of investor/firm	Year of establishment	EPZ where located	Capital invested in Kshs

1.6 Please explain how does your institution assist in the marketing of EPZs to potential investors?
....
....
....

1.7 What do you think can be done in making the EPZs a viable instrument for attracting investment in Kenya?
....
....

APPENDIX 7: EPZ MANAGEMENT QUESTIONNAIRE

1.0 Place of interview (Please specify the name of the EPZ)...........................

1.1 Position of the respondent

      (01) Managing Director   ☐   (02) Personnel Manager   ☐

      (03) Public Relations Manager   ☐   (04) Marketing Manager   ☐

      (04) Other (Please specify)

1.2 When was this EPZ established Kenya? In 19...............

1.3 Which facilities are within this EPZ? (Please name them in terms of factory houses and dimensions)
....
....

1.4 How many firms are operating in this EPZ? (Please name them and the type of products they produce)

Name of firm	Type of product

1.5 Who owns this particular EPZ? (Please provide details on ownership)

1.4 Why did you decide to locate your EPZ at this site?
....
....
....
....

1.7 Enumerate the regulations and procedures that firms are required to fulfill before locating in this EPZ.
....
....
....
....

1.8 How does this EPZ attract potential investors to locate in it?
....
....
....

1.9 What has been the contribution of EPZs to the Kenyan economy? (Please fill this table)

Year	Capital Investment in Kenya pounds	Local	Foreign
1990			
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			

2.0 How do you market your EPZ to potential investors? (Please enumerate)

....
....
....
....
....

2.1 Which problems does this EPZ face in its operations? (Please enumerate)

....
....
....
....
....

2.2 What do you think must be done to solve such problems and by who? (Please explain)

....
....
....
....
....

Appendix 10: Initial Statistics

Variable	Communality	Factor	Eigenvalue	Pct of Var.	Cum Pct
V 68	1.00000	1	7.97570	44.9	44.9
V 73	1.00000	2	3.21439	16.3	61.2
V 88	1.00000	3	2.73231	10.6	71.8
V 82	1.00000	4	1.15409	6.4	78.2
V 94	1.00000	5	1.02724	5.7	83.6
V 91	1.00000	6	0.85163	4.7	88.6
V 111	1.00000	7	0.52357	2.9	91.5
V 103	1.00000	8	0.43275	2.4	94.0
V 109	1.00000	9	0.40033	2.2	96.2
V 62	1.00000	10	0.23718	1.3	97.5
V 71	1.00000	11	0.15736	0.9	98.4
V 118	1.00000	12	0.11199	0.6	99.0
V 113	1.00000	13	0.09005	0.5	99.5
V 75	1.00000	14	0.04863	0.3	99.8
V 100	1.00000	15	0.03030	0.2	99.9
V 80	1.00000	16	0.01062	0.1	100.0
V 78	1,00000	17	0.00184	0.0	100.0
V 65	1.00000	18	0.0000	0.0	100.0

Appendix 11: Factor Matrix

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V 68	0.83320	0.25497	0.14807	0.18871	- 0.10955
V 73	0.82939	0.10892	0.16901	0.03836	-0.28632
V 88	0.82443	- 0.36865	- 0.25571	0.17286	- 0.02086
V 82	0.78972	- 0.45895	- 0.11549	- 0.21734	0.17451
V 94	0.78304	- 0.09799	- 0.23757	- 0.30571	- 0.11174
V 91	0.78117	- 0.34347	- 0.18091	- 0.25199	0.33098
V 111	0.77023	- 0.21556	- 0.12422	- 0.17636	- 0.41535
V 103	0.76679	- 0.43785	- 0.10019	0.25280	0.06597
V 109	0.75875	0.48027	- 0.25292	- 0.09886	- 0.13283
V 62	0.73186	0.38535	0.19597	- 0.18763	- 0.00466
V 71	0.69487	0.31699	0.29901	0.21172	- 0.19207
V 118	0.68005	0.17722	0.06131	0.23478	0.24398
V 113	0.67330	0.20948	- 0.43829	- 0.45631	0.03830
V 75	0.64646	-0.09481	0.57743	0.06067	- 0.21038
V 100	0.55217	- 0.45695	- 0.41680	0.40650	0.06445
V 80	0.49625	- 0.67622	0.04642	0.40159	0.06618
V 78	0.32027	- 0.04837	0.78280	- 0.30140	0.29752
V 65	0.55140	0.43920	0.15743	0.11723	0.58873

Appendix 12: Varimax Rotated Factor Matrix.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V 68	0.70658	0.25796	0.22223	0.46191	0.01518
V 73	0.76714	0.28795	0.30360	0.21168	0.05804
V 88	0.32072	0.78793	0.36803	0.17437	-0.14744
V 82	0.14936	0.72354	0.46519	0.09206	0.22712
V 94	0.36213	0.38269	0.70842	0.07542	-0.00253
V 91	0.04202	0.65091	0.43018	0.24153	0.23033
V 111	0.68316	0.42035	0.42125	-0.14988	0.12431
V 103	0.28678	0.83396	0.20429	0.19500	-0.02206
V 109	0.43514	- 0.00641	0.60227	0.44632	-0.22226
V 62	0.57734	-0.00879	0.43694	0.42406	0.23152
V 71	0.72310	0.12747	0.11235	0.39603	-0.00263
V 118	0.34153	0.32025	0.15512	0.60426	0.06234
V 113	0.17902	0.08685	0.88795	0.24781	0.09772
V 75	0.72473	0.32318	-0.01061	0.07590	-0.41559
V 100	0.29097	0.12476	0.21250	0.66546	-0.41826
V 80	0.14820	0.91184	-0.12634	0.00855	0.04349
V 78	0.24744	0.05575	0.01053	0.16398	0.89744
V 65	0.13255	0.05682	0.16186	0.87474	0.26439

Appendix 13: Factor Transformation Matrix

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	0.58032	0.51017	0.49170	0.39175	0.08782
Factor 2	0.25797	-0.76830	0.08553	0.55119	-0.17901
Factor 3	0.39689	-0.11578	-0.47067	-0.02106	0.77917
Factor 4	0.14693	0.33407	-0.72728	0.36207	-0.45474
Factor 5	-0.64620	0.15629	0.02128	0.64124	0.38257

Appendix 8: Correlation Matrix

	V68	V78	V88	V82	V94	V91	V111	V103	V109	V62	V71	V118	V113	V75	V100	V80	V78	V65
V68	1.000																	
V73	.71820	1.0000																
V88	.53967	.63621	1.0000															
V82	.42044	.50785	.82426	1.0000														
V94	.58290	.51205	.65602	.79940	10000													
V91	.43593	.50549	.74278	.90419	.68376	1.0000												
V111	.62601	.67793	.65517	.67162	.64544	.55709	1.0000											
V103	.66305	.46696	.82578	.73108	.61695	.68880	.65524	1.0000										
V109	.73788	.66048	.49629	.37347	.63199	.45100	.50870	.40048	1.0000									
V62	.63542	.70173	.46401	.41080	.40935	.46852	.62352	.30196	.67826	1.0000								
V71	.68560	.67858	.37215	.32947	.51550	.34356	.52101	.35427	.58918	.54549	1.0000							
V118	.78242	.44747	.43362	.38389	.46178	.46359	.33159	.61084	.58738	.43977	.41686	1.0000						
V113	.46134	.57317	.49130	.55923	.71071	.66144	.42112	.32885	.75761	.53125	.32463	.38938	1.0000					
V75	.58120	.68522	.48281	.49320	.43305	.30000	.59423	.42536	.29399	.49976	.53824	.46703	.15119	1.0000				
V100	.50304	.48081	.50695	.26291	.33234	.28222	.17469	.30921	.66626	.45544	.54404	.37473	.42667	.09407	1.0000			
V80	.25910	.45735	.71625	.58714	.24420	.57143	.39792	.70434	.0000	.06693	.26994	.23548	.05399	.37143	.12095	1.0000		
V78	.30556	.32246	.01284	.28429	.13401	.31127	.25690	.15380	.06470	.37810	.26537	.20903	.0000	.51187	.22775	.14822	1.0000	
V65	.48274	.36242	.29659	.32560	.25482	.38333	.13050	.25323	.44394	.61861	.50849	.50899	.36221	.31944	.54691	.08214	.36679	1.0000

Appendix 9: Reproduced Correlation Matrix

	V68	V73	V88	V111	V103	V82	V94	V91	V78	V80	V109	V118	V62	V65	V75	V100	V113	V71
V68	.82619*	.03439	.00417	-.06155	-.02631	-.01196	.12451	-.03897	-.04503	.04192	06025	.04084	12133	-.01310	.06481	.14508	-.02120	.08061
V78	-.03439	.89313*	.02929	-.05482	-.01789	-.01334	.05581	.01010	-.07193	-.00174	07983	05534	.04465	05596	.04099	.02157	.02826	-.06107
V88	-.02157	.29568	.87721*	-.06138	-.00129	-.02623	.00495	-.02498	-.04603	.01722	08590	09567	02230	04187	03860	02025	.01314	-.06514
V111	.04265	.52550	.48485	.78051*	-.00627	.05429	-.06082	-.00441	.01322	-.06699	-.06039	.09033	01489	04747	703731	08471	-.03996	-.00159
V103	.17903	.13675	.87542	.53155	.984425*	-.00554	-.03343	.00996	.01439	.00504	-.02051	00321	-.00970	.01361	01136	01972	.00284	.00587
V82	-.14053	.29780	.90158	.46143	.86838	.95309*	-.04852	.00641	.00110	-.00998	-.01910	-.03299	01027	01072	02759	03513	-.02121	-.00297
V94	.14576	.16562	.73648	.15653	.75577	.75212	.76548*	-.03955	-.06558	-.01503	08905	03811	09006	02319	.11289	.10370	-.03336	.05778
V91	.02896	.20802	.90747	.43870	.92629	.91971	.77108	.96590*	.00872	-.01386	-.03024	-.00011	-.06158	.01163	-.00311	02752	.01282	-.01565
V78	.38865	.44403	.55464	.44531	.68838	.59774	.57734	.72402	.89970*	.01237	.076638	.05293	-.02880	-.06442	03010	.01385	.01346	.03197
V80	.09283	.23056	.76641	.69575	.88547	.75170	.55173	.81033	.63844	.93864*	00719	-.00887	02324	-.03103	01227	.05408	.01942	.01681
V109	-.22160	-.26249	-.07161	.07591	-.01085	-.08097	-.04815	-.07253	-.26110	.10852	84304*	10204	07313	09905	-.00654	.01864	-.01250	-.04500
V118	.15749	.48928	-.06726	.49152	-.03438	-.091135	-.23556	-.15517	.07733	.14890	-.34156	84438*	-.02345	06318	00504	05758	.01434	-.07929
V62	-.31032	.24077	-.06832	-.21489	-.29334	-.05056	-.16533	-.04435	.10785	-.25011	-.26717	.13085	75709*	02892	01165	.04679	-.10422	.10638
V65	.30886	-.38093	.04287	-.45252	.10660	.06346	.21934	.10426	.02803	-.19573	-.53490	-.20523	-.07494	88522*	01546	05726	-.01975	-.06380
V75	.21306	.11792	-.21914	-.11575	-.20946	-.18563	.03908	-.31889	-.27817	-.36822	-.11523	17653	-.40388	23729	89835*	07319	-.01126	-.04541
V100	.48314	.02157	.12384	-.12943	.16098	.03695	.33934	.19749	.45579	.02509	10541	-.40261	04679	08683	01452	81961*	-.02617	-.07708
V13	.02120	.19820	.06658	.039305	-.11948	.09099	.29410	.07891	.19194	-.35624	-.18915	-.45987	38289	25892	23772	54257	.92470*	-.04712
V71	.07168	.34553	.12449	.21111	.10809	.17180	.27582	.01138	-.05745	-.00636	03249	20364	42861	-.01038	77237	00500	.19669	.86526*

Key:

* = Reproduced communalities

NB The lower left triangle contains the reproduced correlation matrix; the diagonal, reproduce communalities; and the upper right triangle residuals between the observed correlations and the reproduced correlations

There are 47 (30.0%) residuals (above diagonal) with absolute value > 0.05.