MICRO-ENTERPRISE DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT IN NAIROBI.

BY

OMOTI KEFA MISUKO

B.A (HONS) 1992, Nairobi.

A thesis submitted in part fulfilment of the requirement for the degree of Master of Arts (Planning) of the University of Nairobi.

AUGUST 1995

Nairobi, Kenya.

DECLARATION

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

Signed .....

Omoti Kefa Misuko

(Candidate).

This thesis has been submitted for examination with my approval as a University supervisor.

Signed ..... 20.4.95.

Jason Mochache

(Supervisor).

AUGUST 1995.

DEDICATION

This thesis is dedicated to the bright future of micro-enterprise development in cleaner and healthier environments.

DEDICATION

This thesis is dedicated to the bright future of micro-enterprise development in cleaner and healthier environments.

ACKNOWLEDGEMENT

It would not have been possible to conduct and complete this thesis without the help I received from various individuals and organizations.

I owe my gratitude to the University of Nairobi, and the Department of Urban and Regional Planning specifically for offering me the scholarship that enabled me to undertake this study. I am also indebted to my Supervisor Dr. Jason Mochache for his constant personal and professional advise during the writing of this work.

Special mention must be made of the help I received from the micro-enterprises and the residents of Gorofani during the data collection stage. I also wish to express my heartfelt gratitude to my Parents, brothers and sister who have been very helpful, understanding and a source of inspiration during the period of the study.

Many persons contributed to this study, for most part, unknowingly. I have benefited greatly from Mr Kefa Marube who read the first draft of this work, and Eunice for typing. I also benefited from many other people who through discussions made pertinent comments and suggestions. To list them all would be impossible.

TABLE OF CONTENTS

Chapter four

Physical and Sensory environmental conditions of the study area

Chapter five

Theoretical arguments emerging from the data

Chapter six

Conclusions

Appendix

ABSTRACT

The aim of this dissertation is to provide an understanding of the relationship between Informal Sector activities and environmental status in urban areas.It is demonstrated that the understanding is important and should be borne in mind when plans for location of informal sector activities on one hand and environmental management efforts on the other are being drawn. More specifically, the study focuses on environmental management problems that arise in informal sector activity areas. From this case a generalised approach for understanding environmental problems that are likely to arise as a result of Informal Sector Activities (ISA) is made.

The study set out to find the relationship between micro-enterprise development and environmental management problems in Nairobi. Micro-enterprises dealing in the sale of fruits and vegetables and second hand clothing were selected both in the CBD and Gorofani residential area for analysis. The study used personal observations,interviews and research questionnaires to collect data on environmental problems affecting micro-enterprise development, environmental problems resulting from the location of ISA in the CBD and Gorofani and health implications of the environmental problems identified.These was obtained from micro-enterprise operators, ISA buyers and urban environmental managers.

The study found out that there are environmental problems in the study area caused by the operations of ISA. Such problems include sensory environmental problems such as high noise levels, uncollected garbage, occupationally strenuous environments for micro-enterprises dust and high temperatures both in the CBD and Gorofani. It was also established that the environmental problems identified have serious health consequences for residents of Gorofani and the CBD. Such consequences include impaired hearing, and dust and garbage related diseases.

Based on the field findings, the study recommends a separation of ISA from formal planned activities like residential and formal commercial establishments in the study area. In situations where a total separation is not possible like in Gorofani, the study recommends a redesigning of this residential area to accommodate both residential and informal business activities. This should include the improvement of urban services like water, garbage collection and other conveniences, alongside the improvement of individual dwelling units to reduce the nuisance of high noise levels and dust caused by ISA in the study area.

List of tables

List of plates

List of maps

List of figures

List of abbreviations

ISA Informal sector activities

CBD Central business district

NCC Nairobi city council

Env. Environment.

Env. man. Environmental management.

CHAPTER ONE

The Problem and its Significance

1.0 Introduction

Evidence has shown that informal sector activities are a growing phenomena in LDC's urban environments. Such evidence suggests that the activities will continue to grow as long as the LDC's conditions of poverty, high population growth rate, high rate of urbanization and unemployment and underemployment persist.

The unemployed respond to the unemployment problem and poverty, by joining the informal sector. Characterized by ease of entry due to its relatively low capital and technological requirements and low level of knowledge required the informal sector becomes thus more appealing to the less privileged members of the society.1

Confronted by the improperly functioning markets, and inflexible zoning regulations, the informal sector activity operators often have little choice but to occupy fragile or polluted areas, areas zoned for activities like residential and formal commercial enterprises[1]

---

[1]. Sinclair (1978) argues that once the poor do not have access to urban land parcels that are suitable for settlement and enterprise development, they occupy areas zoned for other urban activities and thereby degrade the environment. In Nairobi this is observed in residential areas like Mathare,

As this trend of development continues for long, environmental management problems are the most likely result.

Environmental management is the influencing of human activities as they affect the quality of mankind's physical environment, especially the air, water and terrestrial features. The methods of environmental management can vary immensely. Human activities being influenced can equally vary. The term environmental management can also be used to refer to a conscious, systematic effort by one or more persons acting in concert to produce an atheistically pleasing, economically viable and physically healthy environment.

The essence of environmental management is the influencing of human behaviour to maintain environmental quality. Acts that diminish quality are discouraged while those that enhance quality are promoted. Positive attitudes towards environmental quality have to be created, and people motivated to act upon those attitudes (Sewell 1975)[2]

The environmental concept has been ill defined. it means different things to different people. It ranges from the concept of air, water and land to a global sense where it means the whole range of influences(human, Natural, economic) which affect the individual at every moment of his daily life

---

Mukurue, Korogocho and Gikomba.

2. Sewell; Environmental quality Management, (1975)

and which determine to a large extent his behaviour in every dimension of his being: social, intellectual, emotional, spiritual and cultural (Wandiga 1979)[3]

Environment can also be defined as the sum of all external influences and forces acting upon an object, usually assumed to be a living being. For mankind in general the word encompasses the air, water, land, vegetation, various animals and any other matter, force or influence within the planet or outside that could affect a person's life. For most analytical purposes, however, the environment refers to the biosphere, the zone of earth's surface, waters and atmosphere inhabited by living organisms.

For the purpose of this study, the environment of concern is the physical environment encompassing the air, land and the economic and human influences which affect the individual in his daily life.

The objectives of environmental Management have been largely defined by widespread public concern with a set of environmental conditions that are widely considered problems. Some conditions are easily enumerated such as visible smog bands in the cities, reports of health effects from pollutants in air and water, visual litter, noisy streets, clogged

---

[3]. Wandiga (1979) explains the role of environmental law in urban environmental management. Wandinga argues that the law should be used to protect people from undesirable environmental problems that affect them socially, intellectually emotionally, spiritually and culturally.

highways and congested streets. Underlying causative factors for environmental management problems, are public values and attitudes that have produced and perpetuated undesirable environmental conditions.

Among the public activities and attitudes that are likely to produce and/or perpetuate undesirable environmental conditions are informal sector activities (ISA) in urban areas. This is likely to be the case because of a number of reasons. First, is the attitude of the ISA operators towards environmental management. The ISA operators only observe the economic motive of their trade. Secondly is the lack of control. This is evident in the way the local authority treats the ISA problem in such a way that they (ISA) are not restricted to the right places, or when they must be in their present positions they are not encouraged to manage their wastes. This is accompanied by the lack of infrastructure and waste management services in areas occupied by ISA. Thirdly is the lack of involvement of the ISA operators in environmental management.

Scholars have defined informal sector activies differently. Aleke-Dondo et al (1986) have defined the informal sector with reference to employment. They say that a convenient way to define the informal sector is to look at it as a residual of those who have not been included in the formal modern sector employment reach. They define an enterprise in the informal sector to include any economic unit

engaged in the production of goods and services, whether it employs only one person or more. Whether or not it uses fixed capital, whether or not it has a fixed location for conducting business. Other definitions like Sinclair (1978) see the informal sector as the small enterprises in which people in LDC's cities find subsistence, while Ryan (1986) defined the informal sector as the embrace of activities in the LDCs which fall outside the tax net; but excluding those in the formal sector who evade taxation.

For the purpose of this study, the informal sector activities are seen as :Those small enterprises of heterogenous types which are geared towards meeting a dire need for subsistence; and are operated in open (jua kali) or in market structures. Their distribution in space has been determined largely by operators perception of a suitable activity space, unless coerced to locate otherwise by the corporate planner, and they are also regarded as illegal because they are not registered as businesses. The informal activities being studied are also characterised by unstable conditions in locations either because of operator"s choice or because of harassment from municipal planning system.Finally, most of these activities have profound linkages with the rest of the urban activity system.

This definition borrows heavily from the 1972 ILO definition and Mochache (1990) definition of informal sector activities. The definition was adopted for the purpose of this

study because of first, it's comprehensiveness in the sense that it practically encompasses most types of ISA in Nairobi, and secondly because it emphasises the small scale of operation of the activities, the locational characteristics of the micro-enterprises and the legality of the micro-enterprises in the urban environments.

The formal sector activities, due to the nature of operation tend to come into conflict with environmental management objectives in cities. It is these conflicts that will be the concern of this study.

1.1 Statement of the problem

Nairobi the capital city of Kenya, is the largest city in E. Africa. Being a primate metropolitan centre, its population has increased rapidly since independence. With the high rate of population increase in the urban areas, high poverty levels and hard economic times, the urban poor have been forced to seek refuge in informal sector activities.

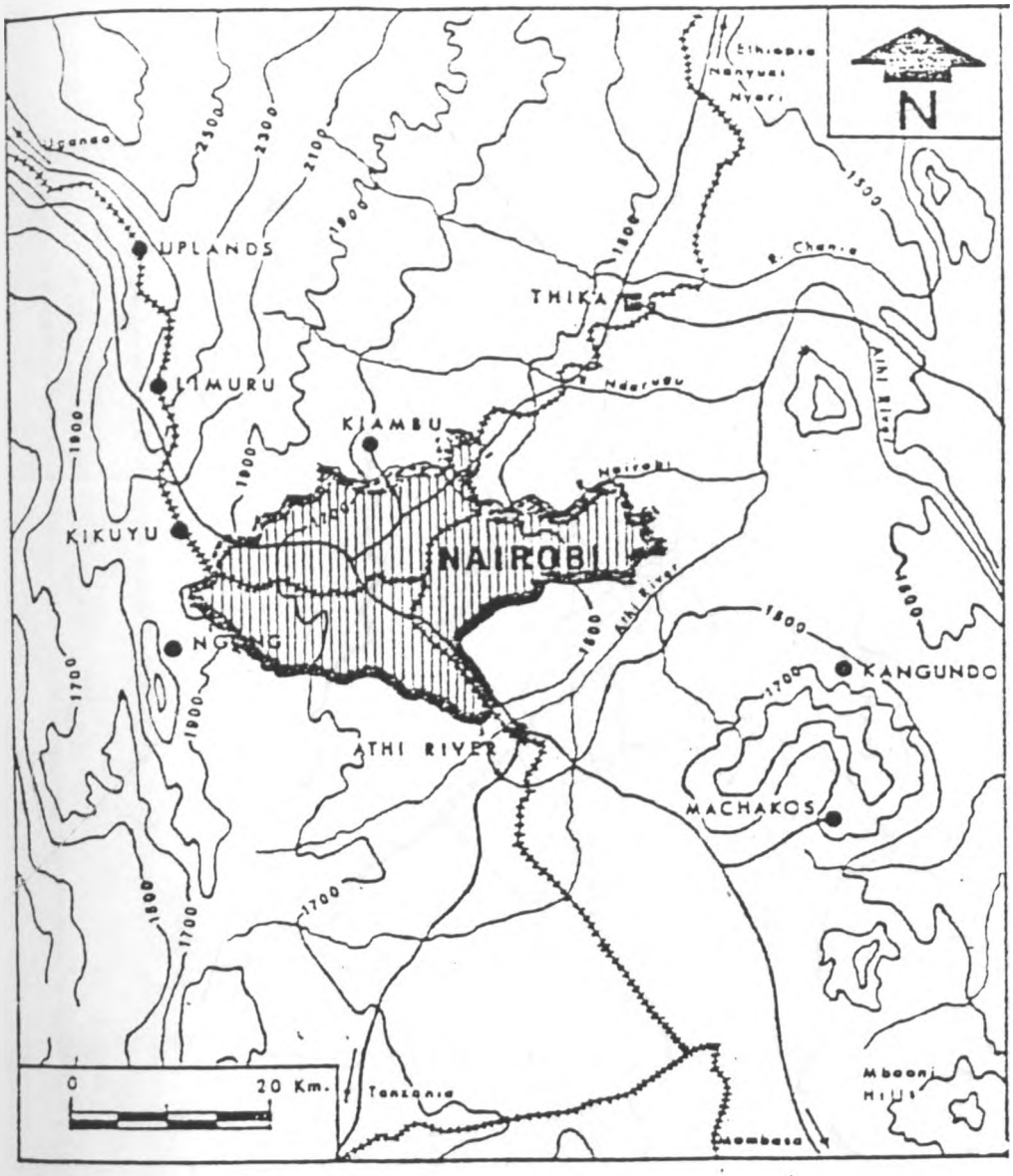
As a result, congestion and overcrowding in the city streets, high noise levels and garbage mounds are common place in the city. A number of transportation problems have also arisen including impeded vehicular as well as pedestrian movement and increased risk of accidents.

Numerous locational studies (Sinclair 1978, Aleke-dondo 1986, Ryan 1986 and Mochache 1990) have confirmed that the

MAP NO. 1.1.: NAIROBI IN THE NATIONAL CONTEXT

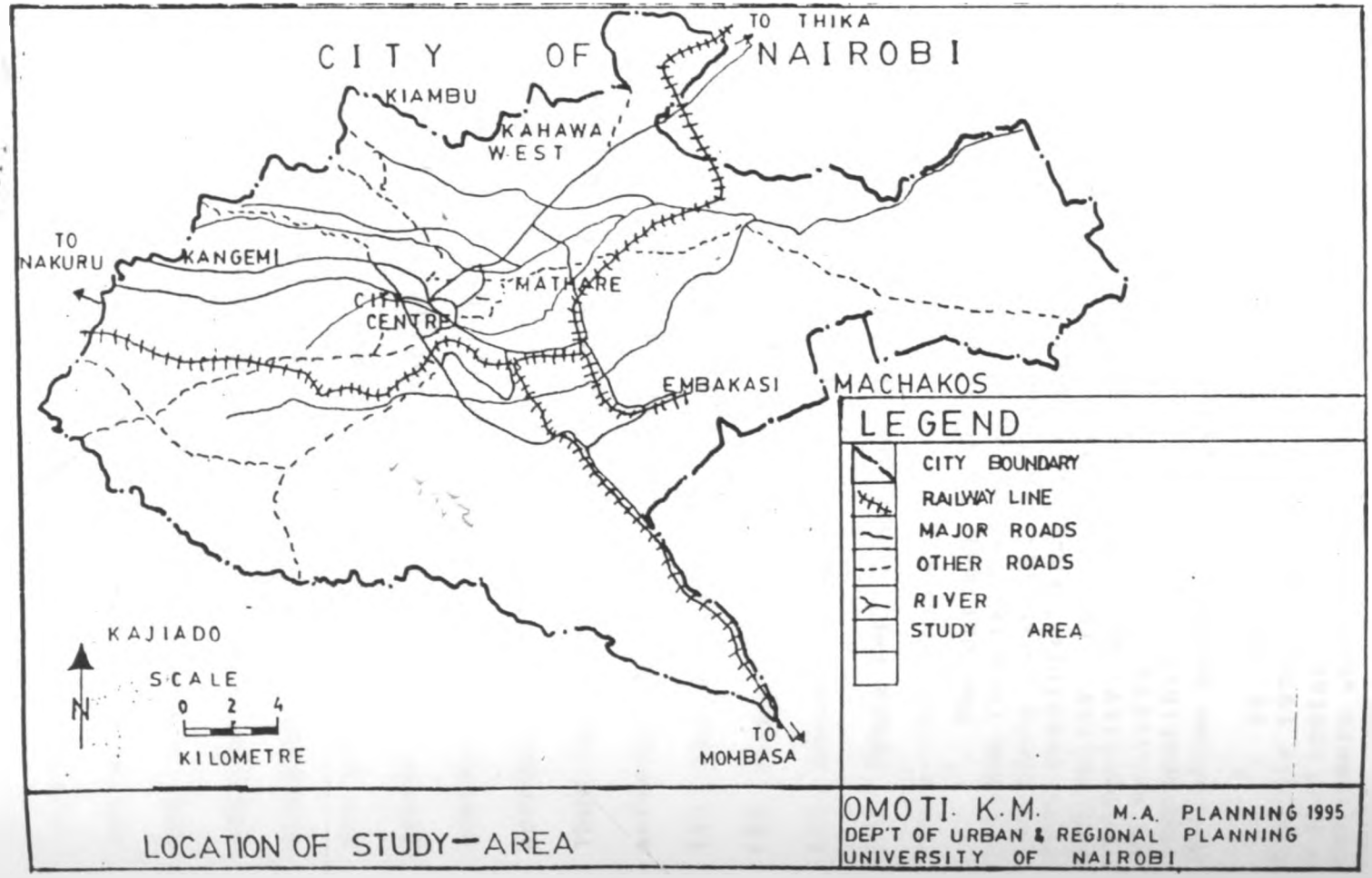
OMOTI K.M.
M.A. (PLANNING) 1995

MAP NO. 1.2.: NAIROBI IN THE REGIONAL CONTEXT



(AFTER MOCHACHE 1985)

MAP NO. 1.3: NAIROBI CITY



desire to maximize profits is by no means the only motive of entrepreneurs but this varies from one enterprise to another. When demand for a particular product is inelastic, the vendors cluster at the centre of the market in order to maximize their revenues, while if consumers engage in multi-purpose shopping the micro-entrepreneurs will always locate away from agglomerated stores so as to reduce the rate of multi-purpose shopping and increase their own share. The optimal locations are sites that provide maximum revenue[4]. Other scholars have given factors considered during location of a business as accessibility to inputs, accessibility to markets, space rent, accessibility to operators' residence and security at site. Thus the selection of site "i" will depend on the type of activity "M" which will then determine:

(1) The accessibility required in relation to consumers,

(2) Accessibility in relation to inputs,

(3) Amount of space "S" consumed by the activity "M",

(4) Space rent functions "R" (Mochache 1990)[5]

---

[4]. The optimal location discussed here is the economic optimum from the entrepreneur point of view. The entrepreneur considers locations that generate maximum revenue at the least cost possible. However a conflict arises when entrepreneur optimality is evaluated against the urban manager's optimality, where factors such as suitability of the site for an activity in terms of environmental impact and land use incompatibility are considered. Conflicts emerge in terms of pollution accompanied by environmental health problems.

[5]. It is argued by several scholars (Mochache 1990; Siclair 1978, and Ryan 1986) that the revenue associated with a particular site depends on two factors. First the number of consumers who patronise the business and secondly the rate at which the consumers make the trips. The best locations

The activity operator is interested in site "i", the result of effective demand for the activity services, for this is what will determine the rate at which the activity makes profits and therefore answer the motive of the operation.

These various scholars show that rarely does an informal sector activity operator consider the environmental conditions as a major factor in location.

On the other hand environmental management theorists consider unplanned activities in the urban environments , such as the informal sector activities a threat to the urban environment. The Tenth general assembly of the IUCN held at New Dheli in 1969 defined the objectives of environmental management as follows:

1. The organization and optimal use of land; through a rational process of development.
2. The economic efficiency which must take into account both tangible and intangible values.
3. The well being of man in order that he may reach his full potential and attain an existence of some quality.
4. The process of evolution. The acceptance of the objectives bring us into conflicts with unplanned urban developments.

---

therefore when firms are threatened with competitive entry and the presence of multipurpose shopping is to chose sites which are highly accessible to consumers.

When the objectives of environmental management and those of entrepreneur location are put together, a conflict arises which brings environmental management problems such as land use, general growth problems, solid waste and waste water among others. Other conflicts like high noise, congestion and psychological disturbance are also possible.

It has been suggested (Theodre 1969) that informal sector operators are driven by the need to survive economically; but economic forces are not always reliable for directing the most reliable and desirable urban pattern; that which maximizes individual and collective health and well being to the greater extent.

This study was broadly concerned with the fact that most studies on informal sector activities gave far too little attention to environmental management and its implications in the locations chosen by informal sector operators. Before urban managers accept urban development generated by the informal sector activities they must not only ask how much growth and progress it brings, but also how well the environment has been managed to meet the objectives.

In Kenya today there is concern with activities which save foreign currency. There is also concern with the number of job opportunities opened by new informal sector activities. However concern with the environmental management of the new informal sector activities exist only in rhetoric.

This study aims at understanding the environmental management problems and conditions that arise from location of enterprises, in the urban environments; with a view to improving the urban environment.

1.2 Significance of the problem

By and large, micro-enterprises are composed of a majority of the urban poor; who are propelled by a dire need for economic survival.

Unfortunately, it is the same poor who will suffer most incase of severe environmental degradation problems, since the average poor inner city dweller gets a much heavier dose of pollution than the person who lives in a higher income neighbourhood away from the city centre.

Studies done across the cities of the world show that the urban poor are more exposed to air pollution and have higher rates of illness and death from diseases associated with air and land pollution,. One such study, conducted in Mexico city, showed that annual health costs from air pollution were estimated to exceed 1.5 billion dollars. Abnormally high levels of suspended particles have caused an average of 2.4 lost work days per person each year, and 6400 deaths every year; lead exposure contributed to as much as 20 percent of the incidence of hypertension in adults; 29 percent of all children had unhealthy lead levels in the blood (Eskeland

1992, Margulis 1992)[6] It is alleged that all urban dwellers breath the same air and drink the same water, utilize the same streets and open spaces. Because all urban dwellers are affected by the environment in one way or another, they must all be concerned about the increasing pollution and congestion, garbage and misuse of space that threaten the life support system.

Understanding the quality of the physical environment generated by micro-entrepreneurship in the city with a view to improving it, would be in line with the government policy that the informal sector be encouraged to grow and contribute to national development.

It is imperative that urban entrepreneurship be developed so that objectives of enhancing human, social and economic and political aspirations is achieved and sustainable urban development assured. However this cannot be achieved unless there is a proper understanding of the sector's physical environment and how it is likely to facilitate or constrain the ability of the operators to accumulate the much needed income for sustainable development.

Richard Theodre (1964 pg. 19) states that "there is no more effective way of justifying planning standards than to relate them directly to health standards. The problem faced by planners, is therefore, in the final analysis a health

---

6. Bartone C: Policy considerations for urban environmental management in developing countries:URBAN MANAGEMENT PROGRAMME, THE WORLD BAND, washington DC 1994.

problem.

Given that health and environmental management have the prime objective to enhance human life, this study was meant to identify and analyze the most serious environmental and health conflicts generated by location and operation of micro-enterprises in the urban environment; and make recommendations towards achieving environmental management objectives.

1.3 Objective of the study

(1) To assess the quality of physical environmental conditions within which the entrepreneurial activities are undertaken.

(2) To identify and examine the main environmental problems facing micro-entrepreneurship development in the city.

(3) To establish the environmental and health implications of the activity sites chosen by ISA operators.

(4) To assess the possibilities of involving ISA operators in environmental Management

1.4 Assumptions

The study was conducted with the following assumptions.

1. That increase in intensity of ISA in the city has direct impact to environmental degradation in the city.
2. That most ISA operators will be victims of poor

environmental state created largely as a result of the operations of their own activities.

3. That poor environmental surroundings reduces patronage of informal sector operation areas by potential customers.
4. That environmental conditions in the informal sector activity areas can be greatly improved if these activity operators are made part of the urban environment management team.

CHAPTER TWO

Micro-enterprise Location and Environmental Management Conflicts.

2.0 Introduction

This chapter examines aspects of the problem of environmental management and the informal sector. Literature on the poor and environmental management and the theoretical domain of enterprise location was examined. Some of the new approaches to environmental management were also examined under this section.

2.1 The poor and the environment.

The world bank's world development report 1990 estimates that about a quarter of urban population live in absolute poverty-and many more live in sub-standard conditions. In Mexico city, the report elaborates, the highest concentration of dust particles in the air are found in low income sections of the city (Hardoy and satterthwaite 1989).

Foremost among the environmental concerns of the urban poor are health problems resulting from substandard living environment that does not offer protection from garbage

wastes, indoor air pollution, or environmental hazards.

Poverty contributes to urban congestion and environmental degradation in several ways. One is the migration of rural poor to urban areas in search of a living. Because the poor lack financial resources to compete for serviced land, and adequate housing, they often occupy illegal settlements on fragile lands or land zoned for other urban activities. With uncanny regularity the world's most impoverished regions also suffer the worst ecological damage. In recent times, poverty has become an increasingly environmental phenomenon. The poor not only suffer disproportionately from environmental damage caused by the better off, they have become a major cause of ecological deterioration themselves. Economic and environmental degradation have thus come to reinforce one another to form a downward spiral (Durning. B. A 1989).

Poverty can drive ecological deterioration when desperate people over exploit their resource base, sacrificing the future to salvage the present. Environmental decline in turn perpetuates poverty as degraded ecosystems offer diminishing yields to their poor inhabitants. A self-feeding downward spiral or economic deprivation and ecological degradation takes hold.

The poor mainly harm their environment, knowingly, when under duress. Pushed to the brink of starvation, evicted from familiar sites, driven to the frontiers by the pressure of population growth, or deprived of alternatives by misguided

laws and policies, they lack access to significant qualities of land, water or capital to provide themselves with sustainable livelihood.

As the urban poverty trap tightens and the world's poor become increasingly insecure and dispossessed, the conditions for ecological degradation spread to more urban fragile lands. The poor regard environmental management as irrelevant to their most pressing needs-jobs, housing, health care and education (Chrisman 1970, Hare 1970, Newton 1972)

In a setting of rapid urbanization, environmental degradation and poverty, the challenge of environmental Management is to safeguard the health, productivity and quality of life of city dwellers that result from their interactions with the physical and natural environments that surround them, as well as from the changes in those environments induced by human activities.

2.2 Entrepreneurship location:

The first efforts to develop a theory of business location was made in Germany where Thunnen had earlier presented his agricultural location theory. A second attempt was made on location, called Market area analysis. This was based on the total value of sales a particular location was able to command, rather than the amount of territory to which sales were made.

Muller and Morgan (1962) argue that the desire to maximize profits is by no means the only motive of entrepreneurship, but this varies from one business to another. Mclaffety and Ghosh developed a locational concept originally advanced by Hottelings in 1929, that when demand is inelastic, the vendors cluster at the centre of the market in order to maximize their revenues. Ghosh and Maclattery explain further that consumers have no special preference for either store that sell identical goods at identical prices, and under normal circumstances would patronize that which is closer. They explained further that if consumers do not practice multi-purpose shopping, new entrepreneurs will always locate near big stores. If the consumers engage in multi-purpose shopping the entrepreneurs will always locate away from the agglomerate stores[7]

The best location therefore, when firms are threatened with competitive entry and presence of multi-purpose shopping is to choose sites which are highly accessible to consumers and minimize their shopping costs.

---

7. The Gosh and Maclaffty (1962) argument has been strongly confirmed by a later study by Mochache (1990) who argues that as the micro-entrepreneurs move away from the centre of the market their revenue increases steadily out to some point and then decreases thereafter. The optimum locations are the sites that provide maximum revenue which depend on the number of consumers who,patronise the business on singe purpose trips. When new firms enter the un agglomerated business revenue will decline and this will lead to further relocation to the exterior of the other firms in order to increase it's share of the market. This continues until exterior positions are less profitable and firms start competing for interior positions; and the leapfrogging continues.

Hay (1971) and Weber and Symnanski (1973) explained that a vendor will be part time or mobile rather than full time or fixed depending on the density of profit per unit length of the market, vendor transport costs and vendor overhead costs.

A vendor will be mobile if the profit made by moving around those locations is greater than the profit made by remaining fixed at a single location. Hay describes mobile marketing as a situation where the trader decides to market at "n" locations, on an "n" day cycle. This will have the effect of spreading total overhead costs among "n" markets.

The Hay (1971) argument on periodic marketing is very closely related to the Stine (1962) idea that if the inner range of a good exceeded the outer range, the trader must become mobile or go out of business. Thus in areas of low population density or demand, a product for which people are not willing to travel much has to be sold by an itinerant trader if it is to be sold at all.

Mochache concludes with an analysis of the factors considered during location as: accessibility to inputs, accessibility to markets, space rent, accessibility to operators residence, security on site availability. He states that theoretically the selection of site, which will then lead to increased outputs, will feature a number of considerations: The total cost of locating a unit of the activity at the site, and the consumer demand factor for services of activity output "S". Thus the selection of "C"

will depend on the type of activity "M" which will then determine:

(i) The accessibility required in relation to consumers.

(ii) Accessibility of the activity in relation to inputs.

(iii) The amount of space consumed by the activity "M".

(iv) Space rent functions "R."

In addition to this input components considerations, on the final analysis activity operator is interested in the site "i" the result of the effective demand for the activity s' services, for this is what will determine the rate at which the activity makes its profits; and thereby answers the motive of its operation.

According to Christaller, reflecting on the overall motive (profit), a business would only earn normal profits from the location if the threshold sales are transacted at minimum costs, hence this requires that a location which minimizes the delivery costs of consumer movements; in case where a consumer comes to purchase the good is attained.

All the above discussed business location theories emphasize the profit motive of the entrepreneur. They also stress the need to locate strategically so as to reach the maximum number of consumers while incurring the least cost possible. What is not mentioned however is the likely environmental effects of the sites chosen, and the cost incurred by society due to the choices made by businessmen.

All the above economic locations generate by products. Some do not have sufficiently high market value and it is not profitable to process them further. They are therefore discarded to the environment. The discharge of wastes into

It is in the context of the above discussed locational concepts that recent events in enterprise development have failed to meet expectations; as explained by the following reasons.

1. First there have been uncritical dependence on the Market Mechanism to determine choice in what is to be produced, in what proportion, and where the production activity is to be located. While markets may give valuable guidance on public policy, even the most perfect of all markets cannot appropriately reflect human needs because they typically do not take fully into account social and environmental degradation.

2 Another fundamental cause has been that priorities for public investment have not necessarily been guided by conscious concern for improving levels of living of the poor in particular or for protecting and enhancing the human environment in general.

3. A third main cause of the failure of the growth experience and enterprise development to enhance globally the quality of life has been the absence of enough knowledge about the changing conditions of human life,

too much readiness to accept blindly simple economic indicators of national success. We have not looked at our quality of life comprehensively enough nor have we looked far enough into the future (Tolba 1976).

2.3 The art of environmental management over the years

The decades of 1960s and 1970s have been marked by a growing perception of environmental problems based on a recognition of the importance and complexity of the interrelationships between mankind, the global resource base and the encompassing environment. The 1960s witnessed the rebirth of environmentalism, not as a unitary movement but sectioned into a diversity of groups and ideologies.

The rebirth of environmentalism in the 1960s was confined to the industrialised centres of the north. In the developing countries of the south environmental policies, over and above concern for basic necessities were regarded as un affordable luxuries (Turner 1988).

After the 1972 Stockholm conference on human environment, developing countries, while pressing for the establishment of the new economic order came to realise that the health of the environment should concern them as much as it did the industrialised countries.

Currently in the developing world, the groundwork is expanding impressively in many regions as poor people organise

themselves to fight poverty and environmental decline (Turner 1988). Indeed the proliferation of self help groups is the most heartening trend on the poverty front. In many cities of the world, self help organizations have grown steadily, as economic and environmental conditions have deteriorated.

Tolba (1976) states that the concern for the environment is an indispensable aspect of concern for humanity. If we are concerned with humanity, the greatest challenge we face today is to design development that satisfies basic human needs, and is at the same time sustainable and environmentally realising, respecting the earth's biological tolerance levels. The challenge can be met through environmental Management, which is based on the following principles.

(i) Economic and social development must be pursued to meet the basic human needs of all people and secure better prospects for them.

(ii) Environmental processes must be thoroughly and widely understood;

(iii) The productive capacity of the environment must be maintained and resources be used rationally.

Many of the problems of human activities result from exceeding their environment limits. The activities are not related to manageable resource bases. They are outstripping the ability of their resource to provide for the need of the inhabitants and in the process, they are destroying the environment upon which they depend.

Tolba (1976) gave some basic principles of development as :

(i) That the immediate purpose of any development should be to satisfy human needs.

(ii) That the process of development itself can and should improve the environment. Deleterious effects often result when development activities are haphazard and un managed and do not take account of ecological constraints. When these happens the natural resource base upon which continued development depends is placed in jeopardy.

(iii) That we must monitor the impact of development process and identify when this threatens the life supporting systems of the biosphere and thus endangers human well being.

Micro enterprise development, being one of the development activities to satisfy basic human needs in the urban areas, has failed to observe these basic principles. Instead of improving the environment, the ISA operators do not take account of the ecological constraints of their activity sites. It is also true that through air, land and water pollution, ISA threatens the biosphere and endangers human well being.

Miller (1979) has given the following guidelines for environmental management.

(1) Moral persuasion or preaching-persuade polluters to

refrain voluntarily from polluting as an obligation.

(2) Tort system - use legal system to sue polluters for damages from pollution.

(3) Direct regulation- Issue licenses and permits and set up and enforce compulsory pollution standards.

(4) Payments and incentives - control pollution by paying polluters not to pollute.

(5) Pollution charges- Tax each unit of effluent or emission released during a particular time period.

The Miller guidelines give the available options to environmental Management. The first option of moral persuasion and preaching has little applicability to the Nairobi environmental management situation. The Tort System may work as a solution but will in effect increase costs of operation for enterprises and reduce enterprises development. The idea of issuing licences and permits has already failed since Micro-entrepreneurs operate even when they are not licensed. Perhaps the most attractive alternative to micro entrepreneurs is the payment of incentives to discourage pollution though this will increase costs for the environment managers while the taxing system may be difficult to enforce.

2.4 Scope of the study

This study was limited to the Nairobi CBD and Gikomba Market Neighbourhood. It therefore covered the area bounded

by Uhuru Highway to the west, Railway station to the South, Nairobi river to the North. To the south east, it stretched through quarry road market to the Gorofani high rise residential area.

The study was limited to the conflicts emerging between the locational behaviour of enterprises, on one hand, and environmental management efforts on the other hand. The study focused on two categories of enterprises, that is the fruits and vegetable vendors in the CBD and Gikomba, and textile hawkers both in the CBD and Gorofani area of the Gikomba neighbourhood.

2.5 Conceptual framework

The environment is perceived to be comprising of the totality of air, water and land. In this context then, environmental degradation involves any alteration of the environment or addition to the environment of injurious substances to the extent that it becomes unpleasant to man's five senses i.e. the sense of touch, hearing; sight; smell and taste.

Environmental Management then, aims at addressing the deteriorating environmental conditions in and around cities which present major obstacles to sustainable socio-economic development.

This study aims at presenting the argument that environmental degradation arises due to different perceptions which lead to conflicting activities. For this purpose, three categories of people; i.e. the enterprise operator, the potential patrons and the environment managers were studied and their perception of the environment analyzed.

For micro-enterprises, the most important driving factor for the entrepreneur is the profit. Pure profit motive calls for choice of the most appropriate location that would maximize access to customers and therefore sales. This meant that they could locate business in any suitable premises regardless of environment consequences.

The micro-enterprise users are driven by the need to purchase goods they needed at affordable prices. They also needed to purchase the goods conveniently along transportation channels; cheaply and safely at points where they could easily catch their means of transportation. Ironically the buyers also wanted to purchase from clean and un congested environments.

For the urban environmental managers, their main guiding principle was the city planning and development control regulations. The environmental managers saw the ISA operators in the study area as an environmental nuisance, while the ISA operators saw the environmental managers as oppressors. This attitude was manifested in the constant harassment and clashes between the Isa operators and the NCC askaris. Unfortunately

the city environmental managers have failed to put in place infrastructure and services that could reduce the impact of ISA on the environment. Lack of such services like regular garbage collection, event distribution of litter bins, and cleaning of communal facilities like toilets and playgrounds in the residential areas used for ISA makes the environment worse.

The micro-enterprise location characteristics guided by the profit, tend to be in conflict with environmental management objectives. The conflicts that arise are manifested in air pollution, unhealthy housing conditions, noise pollution, water and sanitation problems and solid waste accumulation in urban environments.

For ease of analysis of the profit motive- environmental management conflicts, two informal activity types i.e. Fruits and vegetable sellers and second hand cloth dealers were studied in relation to their effects on the environment; the formal commercial activities and formal housing. This was done with a view to coming up with policies and measures that could either eliminate these conflicts altogether or at least reduce their impact on the three categories of people mentioned above.

The study was focused on finding out information on the quality of physical environmental conditions within which many of the entrepreneurial activities were undertaken. These information is obtained from the three groups of people

mentioned above. The respondents were asked questions on the environmental problems arising from location of enterprises at various zones. Questions pertaining to garbage generated, congestion along transport corridors, high noise levels, and visual discomfort associated with particular locations were posed to non-informal sector respondents like formal shop operators, hotel and supermarkets and Gorofani estate residents.

It was considered useful to find out the main environmental problems hindering entrepreneur development. This was acquired from ISA operators who were asked questions on how they felt their surroundings affected their turnover and progress. It was also considered useful to find out how the ISA affected the environment and the possible health implications of the activity sites chosen by ISA operators. This information was derived from data obtained from non informal sector respondents especially those of Gorofani estate who were asked to state various environmental disadvantages they suffered as a result of their living next to ISA activities and possible health problems that might have arisen as a result of this. The information relating to environmental problems was acquired from the city environmental managers, who were asked questions on problems related to the environment that arose from ISA, and their efforts to cushion them. They were also requested to give their recommendations.

Finally the study sought to find out the possibility of involving ISA operators in environmental management alongside other members of the public and non informal commercial enterprises. This came from the recommendations of the three groups i.e. operators, the urban environmental managers and the ISA Buyers. Questions on the possibility of the participation of the members of the general public were also be asked to the three groups.

The environmental problem in the informal sector activities can be represented in the conceptual framework as follows.

Th first aspect is that affecting the business operator. This is represented by ISA (O), where the ISA (O) locates where profits are maximum (P), accessibility is maximum (a), and maximum convenience (C). It can therefore be concluded that ISA (O) =(P,a,c).

The ISA (O) can maximize profits by reducing input costs, discarding wastes without spending money or effort to collect and dispose them. The ISA (O) maximizes accessibility by locating along transportation corridors, like street walkways and transportation terminals both in CBD and low income residental areas. All this ISA (O) behaviour is referred to as economic location in the framework.

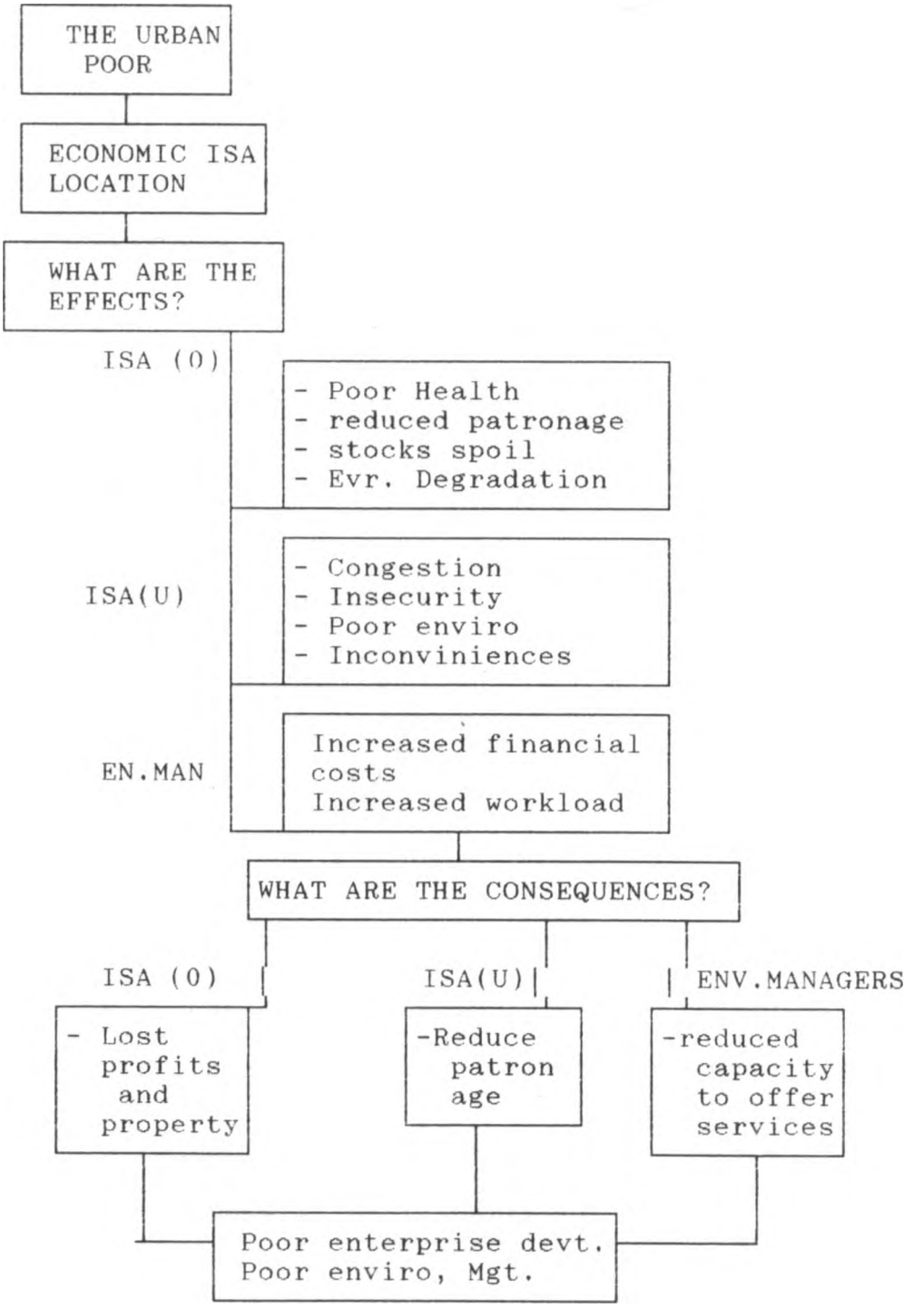
The second aspect is the one concerning informal sector activity patrons (users). The users were characterised by the need to purchase cheaply, conveniently and safely. The users

are represented by ISA(U). It can be concluded that ISA(U) = (c, ci, s).

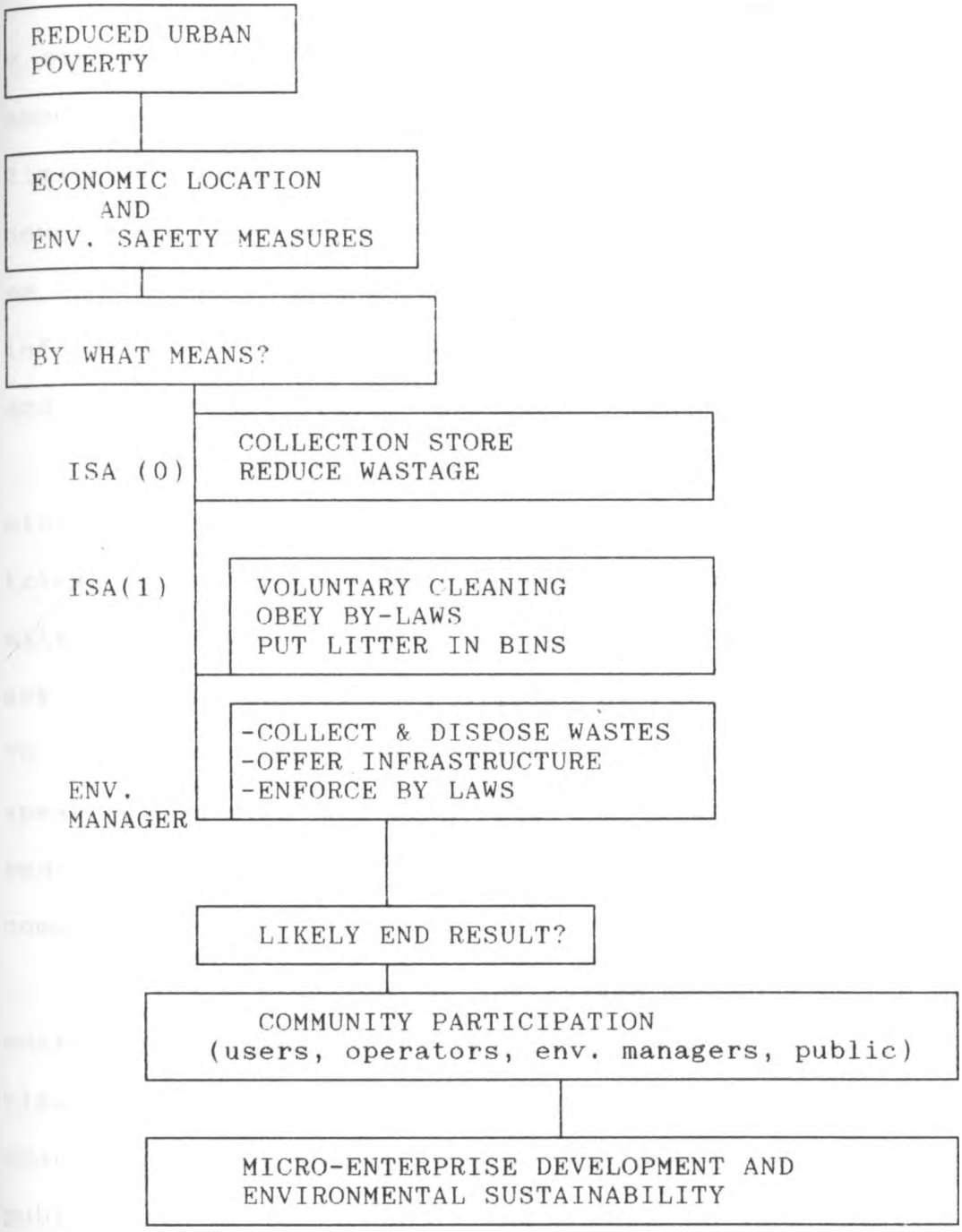
The third aspect concerns the urban environmental Managers. The urban environmental managers use zoning principles, development control guidelines and evictions to control ISA. In the model, this is represented by "Environmental Managers".

2.6 Schematic presentation of the conceptual framework:

The problem state



Possible solution



2.7 Research methodology

Micro-enterprises and their development potential is not a new concept in Kenya. It has been studied and has vast amounts of literature. It however becomes a major research limitation when one tries to relate the micro-enterprise development problems on one hand and environmental management on the other. This is particularly so when one tries to get information on how micro-entrepreneurs affect the environment and formal commercial enterprises.

Due to constant harassment from the NCC askaris, the micro-entrepreneurs are always suspicious of any person who tries to know how they trade and why they trade for particular sites. It becomes worse when you present a questionnaire and ask questions on how they dispose of the garbage generated. To counter this problem, a young simply dressed, Kikuyu speaking research assistant was recruited. This helped to reduce suspicion from the mostly Kikuyu micro-entrepreneur community.

Another limitation was the stigma attached to the micro-entrepreneurs, and the attitude from the general public, who view the micro-enterprises as a nuisance in town. To get the opinion of non informal sector respondents and the general public without the bias of the stigma, a questionnaire was administered both in the CBD and the formal residential area of Gorofani at Gikomba. The questionnaire was supplemented

with photography, verbal interviews and observation. In Gorofani estate, a middle aged woman of Kikuyu ethnic origin was recruited as a research assistant. This made it easier to gather information from the respondents since the lady is also a resident of the same estate, and was able to get more detailed and intimate information. Getting information from the NCC cleansing administration was also difficult, given the fact that the research was conducted at a time when there were wrangles at the city hall. To get information from this fighting group of councillors and officials, required the services of an insider who would not be suspected as a journalist nor a police investigator. A junior administrative officer, who was a former classmate of the researcher was recruited.

The researcher also relied on reports and studies done by other scholars on informal sector development and environmental management. Reports from the mass media, especially the print media were of much help.

As for the choice of the study area, it was necessary to get a section of the city with characteristics of unplanned informal sector activities alongside planned formal activities in order to bring out the earlier stated conflicts. This characteristics were mainly found in the CBD. Another region that was considered important was one with informal business activities within a formal residential area. Gorofani estate was chosen for this purpose because of the intensity of the

informal activities and their proximity to the residential units. Finally due to the researchers personal and financial limitations the research could not be extended outside the city.

The methodology adopted included both the detailed descriptive data and actual measurements of ISA trading grounds for comparison with recommended standards. The study was able to confirm the locational characteristics of micro-entrepreneurs outlined in chapter two. The study established that during location, the enterprises took into account customer accessibility and therefore the number of sales likely to be made by an ISA operator. Rarely did they consider environmental consequences of the locations chosen. It was also established that the locations chosen by micro-enterprises finally led into environmental and health conflicts between the ISA and planned formal activities.

2.7 Study limitations

This study had a number of limitations. First, was the fact that the researcher was not a trained physical scientist and therefore a detailed scientific analysis of the environmental and health implications of the sites chosen by ISA operators was not possible.

The second limitation was associated with the stigma attached to the informal sector operators who many see as

environmental nuisance in urban areas. This made acquiring information on waste disposal and locational characteristics of ISA difficult.

Finally, time was also a limitation given that this study was carried out alongside equally demanding academic programmes like the urban studio and the usual course work.

CHAPTER THREE

Background of the Study Area.

3.0 Introduction

In this chapter, the physical background of the study area was analyzed in the light of environmental management problems, that were likely to occur at different parts of the city in relation to climate and geological characteristics.

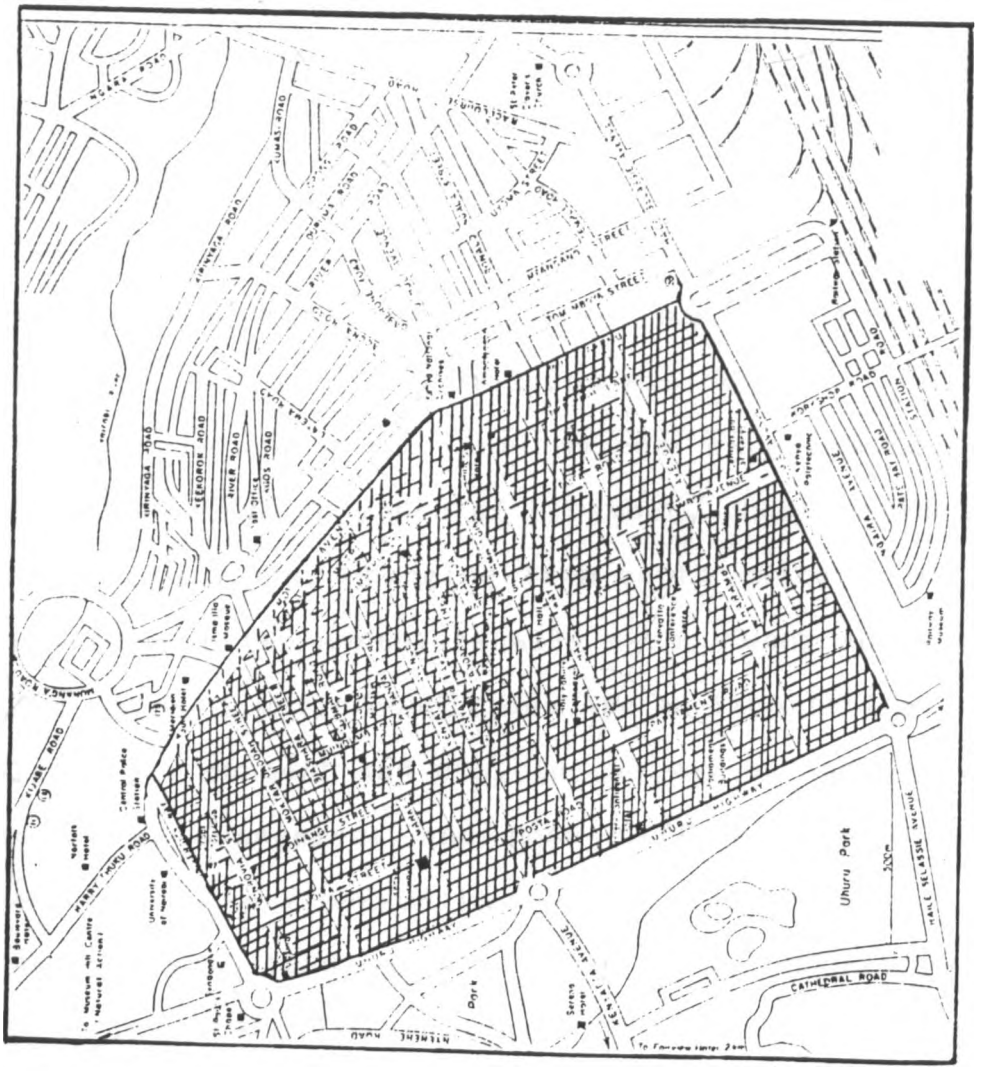
The chapter also undertook to emphasize the relationship between informal sector activities and poor infra-structural facilities in residential areas.

3.1 Physical background

Nairobi city lies at altitude of about 1670 M above sea level although the urban area has a highly variable topography's the height ranges from 1600 M (to the east) to over 1800 M (to the west and north west).

The major features of the study area climate are controlled by the large scale pressure systems of the western Indian ocean and the adjoining continents and its day to day weather is related to the very day to day variation in the pressure systems.

MAP NO. 3.1.: LOCATION OF THE CBD



THE CENTRAL BUSINESS DISTRICT (CBD)

The climate can be subdivided into the north east Monsoon from December to March, with north easterly winds, sunny and occasional rain showers. Then follows the rainy season from late March to May, with light winds, usually warm and becomes cloudier towards the end of the season.

The main season is followed with the south east Monsoon from June to October, with persistent south easterly winds, usually cloudy and cool and drizzles are common.

Towards the end of the year, Nairobi experiences a short rain season during the month of November, characterized with light easterly winds, changing from south easterly to north easterly through the month, usually warm; sunny and showery.

The above climatic conditions are an important aspect of the city's environment and will in one way or another affect environmental management and pose different environmental challenges for every season in ISA operation areas.

According to 1989 census, Nairobi city had a population of 1.3 M in 1989. The Ministry of planning and Economic development projects the population to about two million in 1995 and 2.8 million by the year two thousand (2000). Given that Nairobi has a well developed transport and communication system, as a focus, the large unemployed labour force joins the informal sector with a lot of ease for a livelihood.

For the purpose of detailed analysis of the ISA and environmental Management, a small section of the study area was chosen. This covered the entire central business district

of Nairobi City (see figures 3.1 and 3.2 below) and the Gorofani residential area in the Gikomba neighbourhood. The CBD area is a major seat of economic activities and a major employer mostly in commercial and catering activities; while the Gorofani area is a formal residential area that has been invaded by informal business activities. The environmental problems in these regions are unique to the particular areas and affect the area users differently.

3.2 Growth and development of Nairobi

The growth and development of Nairobi revolved around the railway centre of the growth nuclei; one for railway headquarters and the other colonial administrative centre, north of Nairobi river, at the present day Ngara estate.

The railway nucleus had more resources and could therefore afford to have more technical and administrative staff and attract more professionals like magistrates, doctors and police services.

By the turn of the century the railway nucleus had a section of commercial plots and commercial activities fronting the victoria street, today Tom Mboya street. The street had a hotel, a store, various trading concerns and a soda water factory which formed the very first industry.

Residential areas were rather sparse. Close to the railway was the "Ladhies" housing the colonies, west of the

railway station was the railway subordinates quarters, while up on the hill to the east of the railway complex and its numerous workers provided a stable market for commercial activities.

The population of Nairobi at that time grew rapidly and reached a total of 5000 people in 1902, expanding further to 16000 people in 1910 and up to about 23000 in 1920. By 1948 Nairobi had reached a total number of 100,000 people (ELLIOT 1975)

The rapid population increase led to doubts on the sustainability of the site for a large settlement. Residential areas were composed of very low standards of building, inadequate water supply and poor drainage and sanitation system which later led to the development of slum settlements. In 1902 there was a plague outbreak in the Indian Bazaar resulting in the burning of the area. The problem was not however resolved and the plaque reoccurred in 1904, 1911, 1912 and 1913.

Later suggestions were made calling for the segregation of the Asiatic and African communities from the Europeans. This was deemed necessary due to the unsanitary habits of the Asiatic and Africans making them unfit to take land as neighbours to the Europeans.

Following the segregation policy, Asiatic residential area was established on the northern side of Nairobi river, Ngara and a trading centre on the south occupying the river

road and Kirinyaga road areas.

The Europeans residence occupied the "hill" area and suburbs of Muthaiga. Those and other areas were areas designated as the white highlands solely for Europeans. The Africans, except for railway workers, were left to find their own residence, either in the native reserves or on the road reserves of the township. This was the beginning of informal settlements and informal activities in Nairobi and the plagues and other diseases were testimony of the accompanying environmental problems.

In 1945, a competent planning group led by Professor Thorton White was founded which later prepared a master plan for Nairobi outlining the physical planning guidelines from Nairobi for harmonious functional arrangement. The zone for industrial location was to occupy the area south of the railway station, away from the CBD. The plan also had laid down guidelines for the development of the central business districts with particular reference to the establishment of the "Kenya Centre" as the heart of Nairobi.

A major step towards development of Nairobi was undertaken in 1972 by the Nairobi urban study group. The development strategy that emerged consisted of first, policies related to major aspects of development (employment, housing and transport) and secondly, of a broad physical structure within which policies could be realised. This strategy was formulated on a comprehensive basis to ensure that the

policies and the structure are compatible. The study also laid guide-lines for the expansion of Nairobi. What was forgotten however, was the guidelines for expansion of informal sector and environmental management strategies at every level of development.

3.2.1 The growth and development of the CBD.

The zone referred to as the CBD of Nairobi is bordered by the Uhuru Highway and University complex to the west, Haile-selassie Avenue and the railway complex to the south and Nairobi river as the northern boundary (see map 3.1) It is a centre of many important activities including commerce, administration, religion and culture as well as recreation. Its evolution is strongly tied to the establishment and growth of the railway complex with whose expansion many commercial enterprises were attracted to this part of the town.

The development attracted a large population of entrepreneurs, mainly of Indian, Somali and Arabic origin. There were also a few pioneering african traders. The Kenya Uganda railway authority being responsible for only their workers, left the indigenous and other migrants to fend for themselves. They therefore camped hapharzadly north of the railway station or on the road reserve where there was space.

Conflicts arose over land issues between the railway authority and the provincial administration under colonel

Ainsworthy. This led to the formation of Nairobi Municipal Committee, with Nairobi township under its jurisdiction. Consequently the railway authority was called upon to surrender all land that was not needed. Such land was earmarked for commercial and residential development.
Under Ainswothy, land use pattern was more regularized and defined, roads and plots were surveyed and demarcated, reflecting the commercial and residential segregation policies pursued by the government officers.

The problem of informal sector activities and environmental management was not serious then.
The first attempt to segregate the commercial area came when the India Bazaar was divided. To the west, the European high class business area was developed; with some Asian traders owning a few plots. To the east developed a predominantly Asian and African shopping centre.

By 1906, a definite land pattern had emerged. The Indian Bazaar occupying three streets west of the present day Moi Avenue was most intensively developed with closely spaced single storey buildings, serving as commercial centres at the front and residential at the back. The European commercial area was extensive with wide open spaces. Residential use was highly discouraged in the commercial area. This policy was however silent on commercial use in formal residential areas.

So far it was not possible to attach any economic reason for the development pattern the CBD was assuming. Rather the

reasons were basically political based on racial segregation.

Economic factors came into play after independence. The government of Kenya adopted economic policies necessary to attract private investors with the view to improving the seriously depressed economy inherited from the colonial and industrial concerns, with each keeping its distance from the other.

The promotional policies also led to the growth of tourism, which later played an important role in slapping the CBD. To cater for this important income earning sector, Multi-storeyed hotels such as the Pan Africa, Intercontinental hotel, Hilton, 680 Hotel and many others came up in the CBD.

The economic trend that emerged in the city as a result of the government efforts to attract investors and tourists was one with specialised land use patterns where each activity and its own zone without environmentally undesirable overlaps.

Apart from informal settlements in the outskirts of the city to cater for the attracted industrial and commercial workers, there were no serious informal activities. However as a result of increased population in the city without merging employment opportunities the attracted workers started joining the informal sector economy for livelihood. The CBD, because of its centrality and traffic flows offered a ready Market for their trade. This unplanned business are now in conflict with formal businesses like the earlier discussed hotels and other commercial establishments that have now to

contend with environmental problems arising. Such environmental problems as high noise levels, insecurity, garbage and dust generation and obstruction of potential customers to formal establishments are now common.

3.2.2 The Gorofani estate of Gikomba neighbourhood

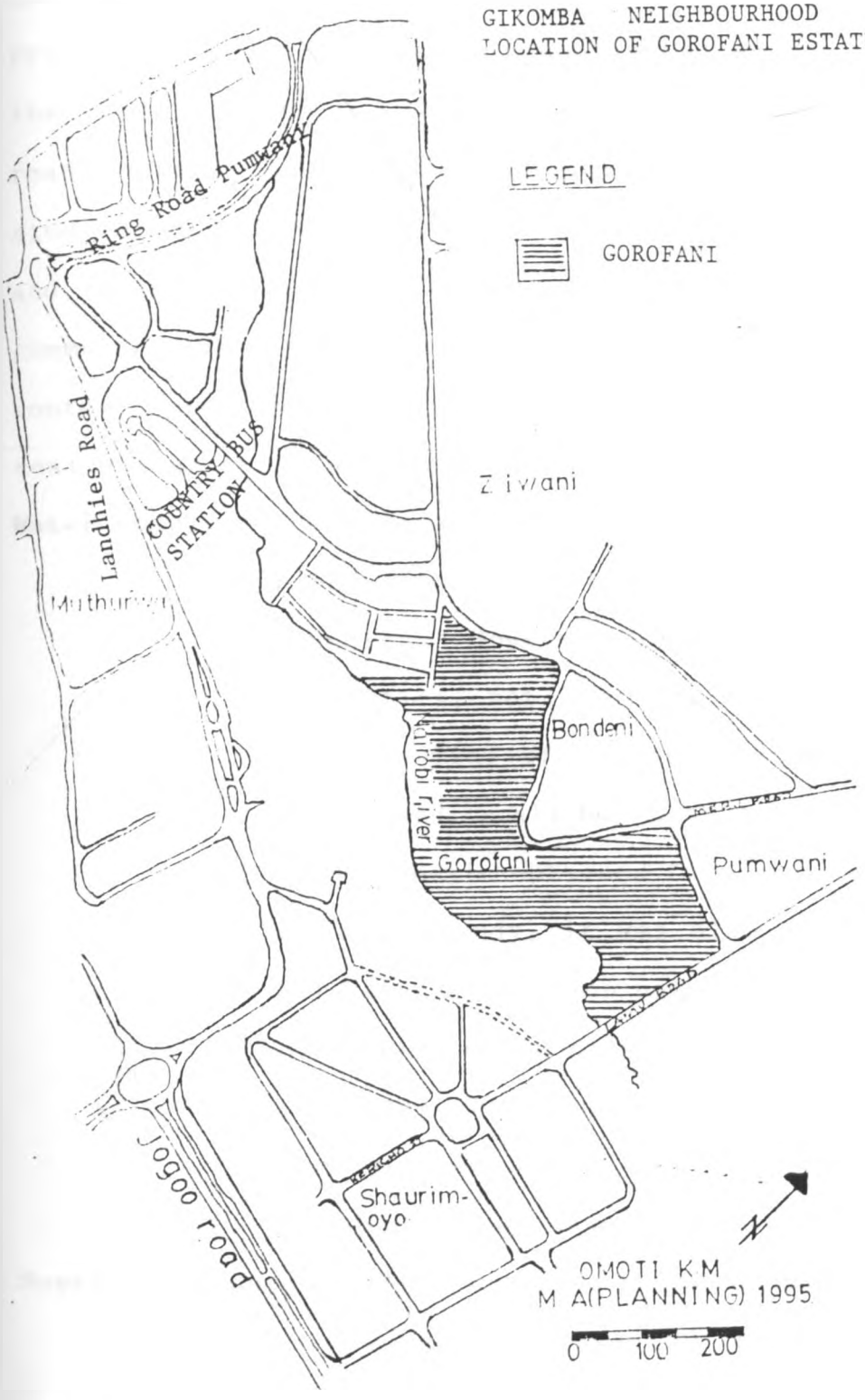
The Gikomba belt neighbourhood is an area of 7.5 Ha, located in the south East End of the Nairobi CBD. It partly comprises the colonial native African residential areas of Nairobi; including Pumwani; Shauri Moyo and Muthurwa railway workers housing (Mochache 1985) (See map 3.2 below).

Among the factors that have contributed to the existence of the Gikomba belt neighborhood at the present location are :- Low value of property due to low cost housing nearby, high population resulting in congestion of premises and inadequate infrastructure, thus making the area less attractive for high class business.

3.2.2.1 Physical infrastructure

The Gorofani estate is surrounded by informal industrial and general commercial activities; which are located in an haphazard manner. The existence of the ISA in the estate is made possible by the abundance of public transportation lines. Such public roads include Pumwani Digo road and quarry road;

MAP NO. 3.2.:
GIKOMBA NEIGHBOURHOOD
LOCATION OF GOROFANI ESTATE

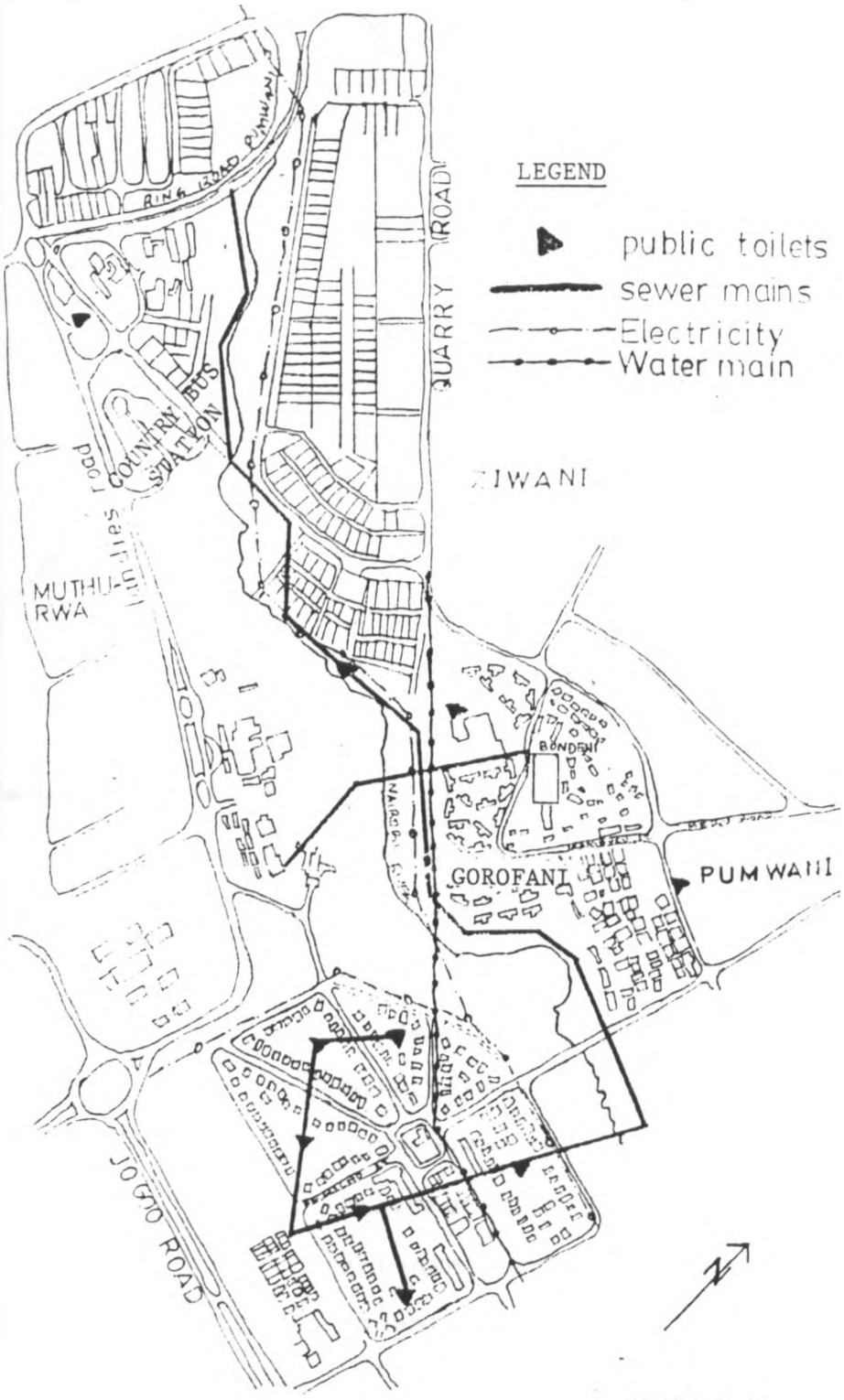


all which connect a number of neighbourhoods to the Racecourse primary distribution road. Landhies and Jogoo road connect the study area to the CBD, while Lamu and Bondo link Jogoo road to Digo road. All the above named roads connect the study area with the rest of Nairobi's commercial, industrial and residential sectors. This makes the area suitable for commuting cheaply given that it is also served with pedestrian routes connecting the Nairobi Industrial area and East lands residential zone through the Gikomba neighbourhood.

Water supply: The Gorofani residential area is served with piped water supplied by the Nairobi city council. However for the informal sector activities, not even one is supplied with a separate line of water. This means that the water used in all business requirements in the study area is obtained from residential units. From the study, it was also established that all water collection points in the residential area were permanently locked to discourage use of water by ISA operators. This also demonstrated a conflict of use of water for residential and commercial interests.

Sewer & drainage: The study area being a formal residential zone, is served by a sewer and storm water drainage lines, designed for only residential purposes with out future

MAP NO. 3.3.: GIKOMBA NEIGHBOURHOOD, GOROFANI ESTATE, PHYSICAL INFRASTRUCTURE.



OMOTI K.M.
M.A. (PLANNING) 1995

anticipation of commercial activities. With the coming of ISA in the study area, the capacity of the sewer and drains is exceeded since it has now to convey much more waste generated by the increased population. The foods and vegetable stands in the residential area exposed to open and un reticulated drains, which meander through the stands and residential area producing bad smell especially in the rainy season. Most of the sewer lines have not been repaired after breakages caused by the second hand clothes delivery trucks, and burst sewer flows in the open drains causing a healthy risk.

Garbage collection: The Gorofani residential area gets Garbage collection visits from the city cleansing department once in every two weeks. This is a zone that is a market place every day of the week, and therefore a visit in two weeks is not sufficient to cleanse the estate. The residents have therefore to contend with garbage mounds and the accompanying rodents and possible diseases.

The experiences in both CBD and the Gorofani estate help to demonstrate that informal sector activities, if allowed to develop alongside formal establishments will finally lead to serious environmental management problems that might outweigh the benefits accruing to ISA operators. The likely problems and efforts necessary to solve them will be the subject of the next chapter.

CHAPTER FOUR

Physical and Sensory Environmental conditions of the Study area.

4.0 Introduction

This chapter is devoted to the analysis of field data in the light of the study objectives. The data was collected from the study area by research questionnaires, photographic surveys and personal observations. The data is analyzed in stages according to the sequence of objectives they were supposed to answer.

4.1 Physical environmental conditions of the enterprises.

The objective addressed by this analysis was to assess the quality of physical environmental conditions and problems within which many of the informal sector entrepreneurial activities are undertaken.

To answer this objective, data concerning the size of micro-enterprises in the city was collected, with the aim of comparing the anthropometrical requirements for similar occupations stipulated in standards and the actual micro-enterprise working space.

Anthropometry gives human space requirements that are right for comfort, safety and environment. Callender and Chiara, in their book titled Time Saver Standards for building types have argued that , good space utilization does not necessarily mean the least possible working space for a person. Too little working space may reduce the worker's efficiency. They continue to give the minimum adult human being space requirements as 2185MM for comfortable high reach, 2045MM for forward bend and 1905MM for upright standing. When seated, a person needs 1590MM for forward bend and 470MM for upright sitting.This also demonstrates that a person requires space of at least 2240MM by 1920MM (see fig no. 4.1). From the field findings, it was found that almost two thirds of the micro-enterprises studied had a working space of less than two square metres.

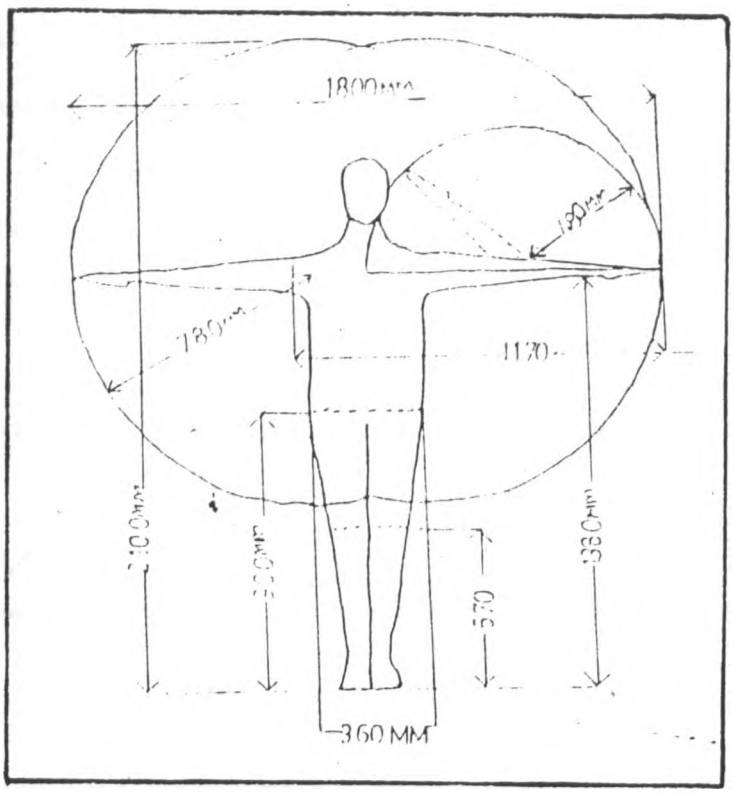
The following table shows the distribution of working space among the enterprises analyzed.

Table 4.1. The distribution of working space for Micro-enterprises.

VALUE (M2)	PERCENTAGE OF ENTERPRISES
<1	29.9
1-2	28.4
2-3	32.8
OVER 4	9.0

Comparing the actual working spaces available to Micro-enterprises in the streets and the anthropometrical

FIGURE NO. 4.1.: DIMENSIONS OF THE HUMAN FIGURE.



(AFTER CHIARA AND CHANDARA)

requirements, it can be inferred that the Micro-entrepreneurs work under occupationally strenuous conditions.This is particularly so in businesses where the operators sell different kinds of goods which have to be displayed in that small space available including space for an aid and a baby sometimes (see fig no.4.2).

To confirm the above conclusions, the people's perception of their working environment was sought and the results were tabulated as below.

Table 4.2. Perception of the Microentrpreneurs about their working environment.

VALUE	PERCENTAGE OF ENTERPRISES
SAFE/CLEAN/SPACIOUS	39
SMALL/UNSHELTERED	17.1
INSECURE/DIRTY/FLOODED	43.9

Source: Field survey 1994.

It can be concluded from these observations that 61 percent of the micro-enterprise operators are not satisfied with the size and quality of their working environment.

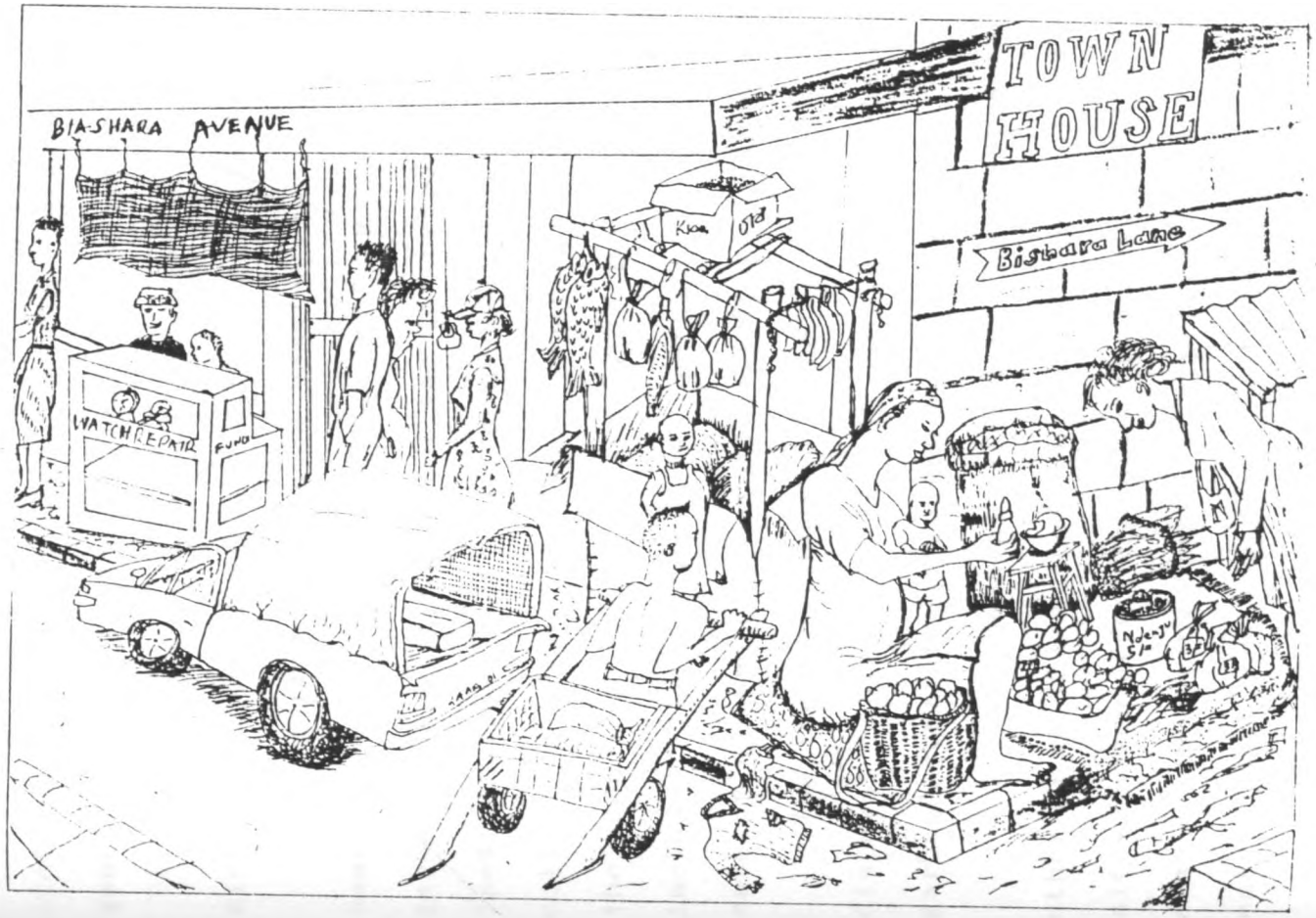


FIGURE 4.2.: OVER CROWDED/STRENEOUS MICRO-ENTERPRISE ENVIRONMENT

4.2 Types of waste generated

The size and quality of the working space is made worse by the types of solid wastes generated by the micro-enterprises in their various locations. The study revealed that the types of waste generated included vegetable wastes, clothing and vegetable wrappers while some enterprises generated both vegetable waste and wrappers.

It was also observed that apart from the solid wastes, micro-enterprises generated high noise levels.

The garbage generated remains on site because of two reasons.First is the influence of the ISA operators on the garbage disposal habits of the ISA patrons, and secondly the ineffectiveness of the agencies responsible for garbage collection. From the field findings it was established that the agencies (persons responsible for the garbage generated) included the individual operators, neighbouring formal enterprises and the Nairobi City Council cleansing department.

The ineffectiveness of the collecting agencies and the disposal habits of the ISA buyers meant that most of the garbage generated remained on site in the study area.

The environmental effects of the uncollected garbage and other forms of nuisance from entrepreneurial activities at the sites chosen affect not only the individual ISA operators, but also neighbouring formal enterprises. From the study, it was established that the formal enterprises located close to the

informal ones suffered from noise pollution, high congestion levels; uncollected garbage generated by the ISA and general insecurity to their businesses and customers.

The study also confirmed that the disposal habits of the ISA operator influenced the way ISA services buyers disposed wastes. From the survey, about a half of the respondents confirmed that the operator"s habits influenced the way they disposed their wastes while the other half answered no. The ISA buyers explained their garbage disposal methods as shown in the table below.

Table 4.3. The ISA buyers' waste disposal characteristics.

VALUE	PERCENTAGE OF ISA BUYERS
DROP ON STREET	27.8
CARRY HOME	27.8
DUST BIN	44.4

Source: Field survey 1994.

From the study statistics, it can be inferred that almost a third of ISA buyers drop their fruit and vegetable wastes and wrappers on the streets for the NCC cleansing department workers to pick. This gradually accumulates to garbage mounds

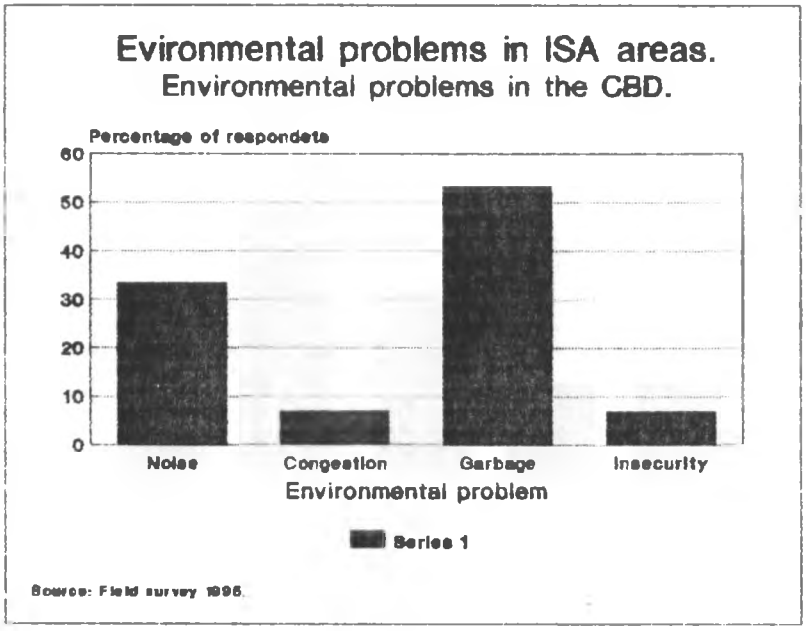
on the city streets, defeating environmental management efforts to keep the city clean. This condition is made worse by the realisation that the NCC has not put sufficient infrastructure to reduce the impact of these ISA buyers habits. Such infrastructure would include garbage collecting bins. Management of the environment would be better achieved if the collection of the garbage generated was left on the hands of the NCC and financed by the ISA operators in the study area. This however implies that the ISA activities have first to be recognised formally and registered as businesses in the study area. This will enable the NCC to collect a levy on all informal businesses in the CBD to finance the management operations.

The data collected in this section sufficiently explains the poor environmental conditions under which micro-entrepreneurial activities take place. The poor conditions also indicate the environmental problems micro- enterprises face economically, in the sense that they discourage potential customers, and physically in the sense that they pose health problems.

4.3 Specific environmental problems in the study area

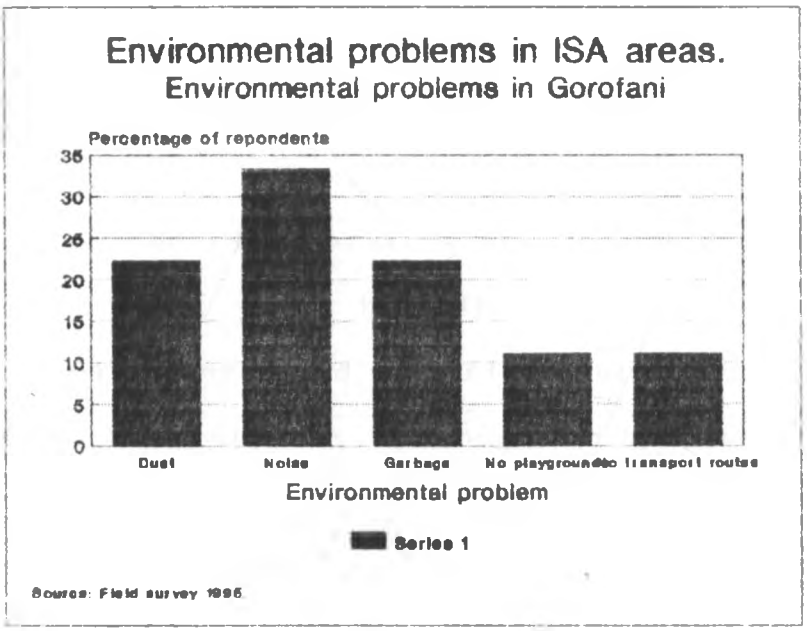
Environmental problems were observed both in the CBD and in the residential area of Gorofani. Environmental problems experienced in the CBD are shown in the graph 4.1 below.

Fig 4G.1 Environmental problems resulting from location of ISA in the CBD.



Environmental problems resulting from ISA in the residential areas were observed in the residential area of Gorofani which is one of the residential areas fully encroached with ISAs. Graph4.2 below shows some of the most serious environmental problems in Gorofani.

Fig 4G.2 Environmental problems resulting from location of ISA in the residential area.



The environmental problems experienced by residents of Gorofani and formal enterprises as enumerated above imply the strenuous experiences of the people involved in respect to the environment of concern, that is the physical comfort, human space requirements, visual comfort, air conditions and noise pollution

4.4 Variation of environmental problems with time

These Environmental problems are not experienced constantly throughout the day. The study revealed that in the CBD, the problems are more intense during lunch hours, that is from noon to 2.00 p.m. while in the residential area of Gorofani, the problems are serious throughout the day. In the residential area, the environmental conditions also change at night when the ISA operators who reside in other estates in the city have gone home.The physical sensory and air conditions experienced at night are different when the following day supplies are bought in by heavy delivery trucks producing high engine noise, while the day's wastes of cloth are burnt producing bad smell and smoke.These indeed create unnecessary heating of the dwelling units (see plate 4.1).

Plate 4.1. Ironing of second hand clothing at the doorstep of a residential unit

The smell produced by the second hand clothes stored in the residential area, after along day of exposure in the sunshine and sometimes rainfall is unbearable at night. The night is also characterised by heavy security patrols by watchmen employed by the ISA operators to guard their goods. The security patrols form a security risk to the residents who come home from work or social places at night, since men are suspected as thieves while women are molested. The night

environment was found to be characterised by rodents and flies attracted by waste heaped in the residential area, which is not only a nuisance but also a health hazard. The poor environmental state of the ISA operation areas as discussed above imply that the informal sector businesses affect not only their neighbours (formal businesses and residents) environmentally but also themselves economically since the poor environmental state discourages potential patrons and poses health problems.

4.5 Health implications of poor physical and sensory environmental state:

The objective addressed by this analysis is to establish the environmental health implications of the activity sites chosen by ISA operators.

To answer this objective, information was collected against a research question that "most of the ISA operators will be victims of poor environmental state created largely as a result of the operations of their own activities. The poor environmental state is also assumed to have an effect on non-informal sector respondents."

The environmental problems affecting the ISA operators, the formal enterprises and formal housing residents as analyzed above, were again analyzed at this section but with a particular emphasis to environmental health.

One of the greatest nuisances facing both formal commercial establishments and residential areas as a result of ISA, is the problem of noise. From earlier scientific studies (close 1966, Moore 1978, Seto 1971), the effect of noise on human beings engaged in any kind of activity be it work, recreation or even sleep range from psychological effects such as disturbance, irritation and annoyance to the harmful physiological effects that produce mental strain and fatigue, loss of appetite and indigestion, headache and in severe cases permanent ear damage. For students, the effect on and detraction from concentration on their home work is expected.

From the study, more than a third of the respondents complained of noise levels that were consistently high and continuous. From this it can be concluded that people who live or work in the study area are likely to suffer from some or all the health problems mentioned above.From the study again, the following environmental problems were the most severe ones (see table below).

Table 4.4. Most severe environmental problems in The study area.

VALUE	PERCENTAGE OF RESPONDENTS
DUST	22.2
NOISE	33.3
GARBAGE	22.2
NO PLAYGROUNDS	11.1
NO TRANSPORT ROUTES	11.1

Source: Field survey 1994.

Environmental hazards arising in small streets businesses include dangerous concentrations of dust, inadequate lighting; ventilation and space and lack of protection for workers from noise. A third of the residential houses visited complained of dust related problems.

In the Gorofani residential area, most of the households were faced with environmental problems such as the presence in the human environment of pathogens that could be directly associated to the ISA and lack of infrastructure and services such as adequate sewers, drains or services to collect solid and liquid wastes and simply dispose of them; and over crowded and cramped living conditions which are a result of more and more space being used for storage and trading of ISA. This also increase the risk of transmission of airborne infections.

The overcrowding observed at Gorofani was made poorer by the fact that the open spaces formerly left for recreation have been taken up by godowns for second hand clothes, while the living rooms were used as washing and ironing rooms for clothes; the windows are closed permanently since walls are used to hang clothes for display by the ISA traders(see plate 4.2 below).

plate 4.2. Permanently closed windows.

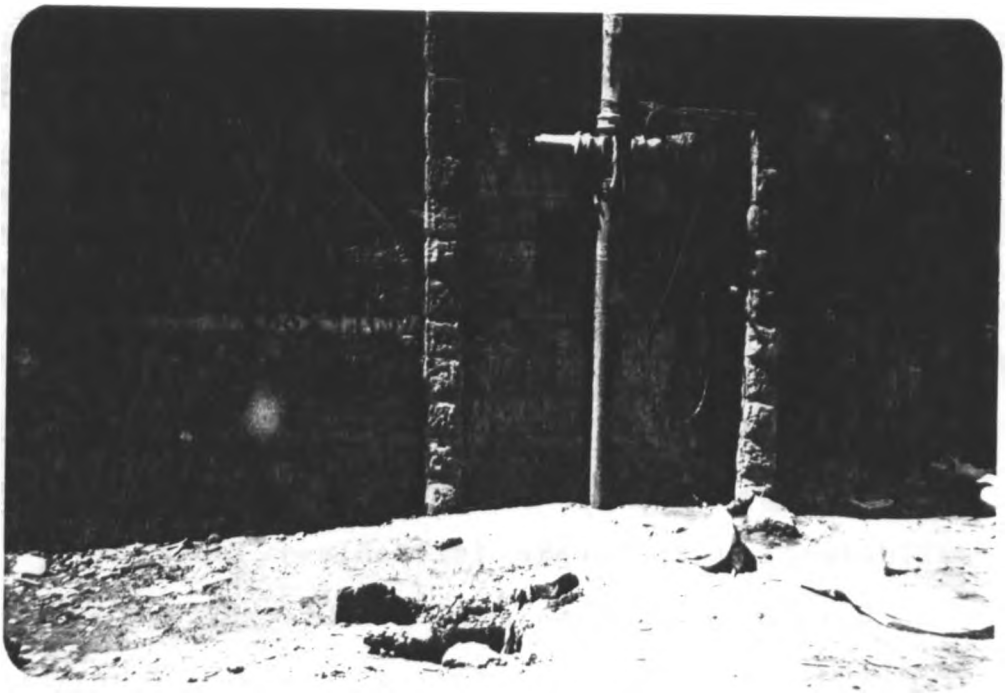
These have serious environmental health problems including diseases such as acute respiratory infections and tuberculosis.

The lack of open space that children and adolescents require for play, sport and social life means that the garbage tips and second hand cloth godowns become their playgrounds in

the absence of any better alternatives. The children are particularly at risk from heavy load delivery vehicles and handcarts that come right into the doorsteps of residential units, pathogens and toxic substances; by contracting pathogens from faecal matter which contaminates the land on which they play or from coming into contact with some toxic chemical or dust from near by artisans dealing in empty pesticides containers or secondhand clothes.

As most garbage generated is not collected, the resulting problems include bad smells, diseases vectors and pests attracted by garbage (rats, mosquitoes, and flies). Since provision for sanitation infrastructure is insufficient, water from broken sewers and drains often contaminated with human excreta becomes a serious hazard for children playing at site. (see plate 4.3 below).

Plate 4.3. Broken sewer.



The environmental health implications of the ISA sites chosen cause a lot of concern when they are evaluated in relation to their position and distance of location from formal businesses and residential units. It was assumed that

the near to this formal establishments, the greater the degree of nuisance and intensity of health hazards.

In the CBD, it was established that 33 percent of the ISA located on the entrance to formal businesses, 47 percent located next to the entrance, 7 percent located across the street while 14 percent located on the road pavement infront of formal businesses. It can be inferred from here that the formal businesses suffer from not only the dust generated at their doorsteps, but also from garbage that is at the end of the day not collected by the ISA operators. The formal businesses' customers suffer the discomfort of pushing their way through the ISA operators and their clients; risking pick pocketing. This inturn reduces the business opportunities for formal and licensed entrepreneurs.

For formal residential areas, it was established that most of the ISA studied located infront of the residential units (66.7 percent), with 33.3 percent locating at the rear. Distance wise about a half located in less that 2 metres from the residential unit wall, while the other half located in a distance of over two metres. The study used the position and distance of location from the residential units to explain the intensity and proximity of nuisance from the ISA. Location infront of the main door has visual disturbance in the sense that every time a resident walks out of the house, or whenever children are outside playing, they are only exposed to bales of second hand clothes, some being washed and ironed; and

surrounded by the garbage generated. This tends to affect the psychological and visual comfort of the residents. Location at the rear means that the occupants of the houses cannot open and get fresh air through their windows; but smoke and dust. The distance from the residential unit; being so close to the units, means that most of the dust generated gets its way to the house, the noise made while customers are being beckoned and the garbage generated , are as well as in the house (see plate 4.4 below).

Plate 4.4. Display of second hand clothes on walls, closing windows and ventilations.

The environment and health effects to the residential areas as discussed above affect residents differently. The study was able to establish that the effects to women and children are different from the effects to men. This is particularly so because women and children spend most of their time at home while men spend a lot of their day time away from home either at work or leisure places. For men it meant that they had to beef up more security for their properties, while they were sometimes suspected as thieves when they came home late and harassed. Just as other members of their families they probably suffer from ISA related diseases, and the discomfort of losing their open spaces to ISA.

The following bar graphs help to illustrate the effects of poor environmental state as a result of ISA in the study area on men, women and children; as was explained by the respondents.

FIg 4G.3 the effect of ISA in residential areas on men.

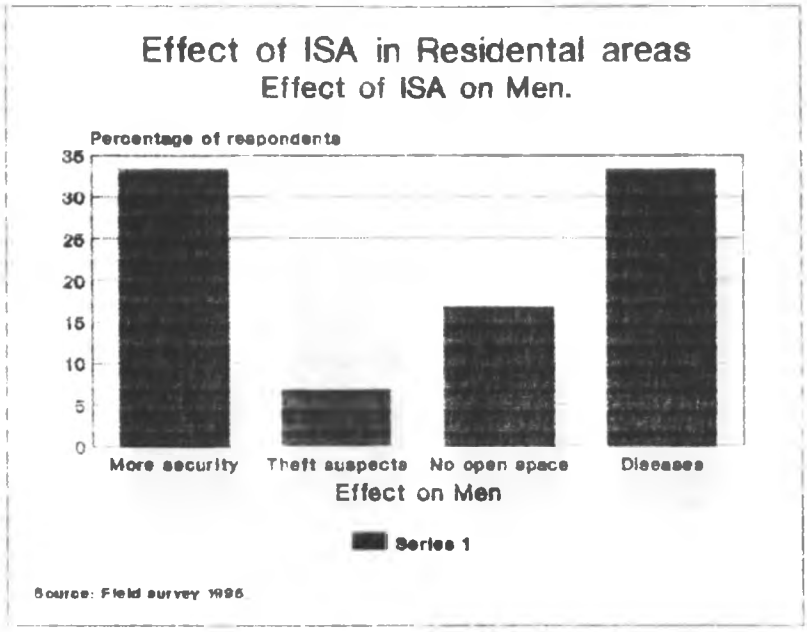


Fig.4G.4 The effect of ISA in residential areas on children.

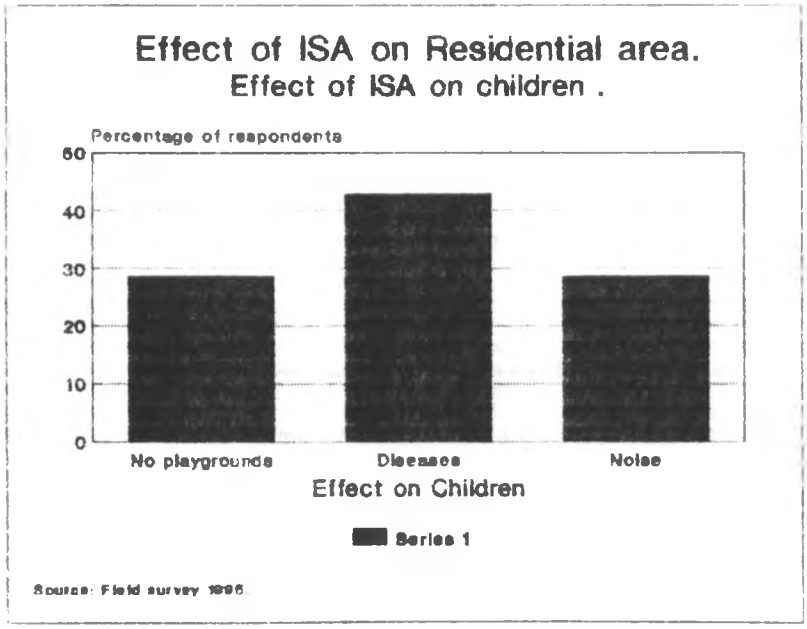
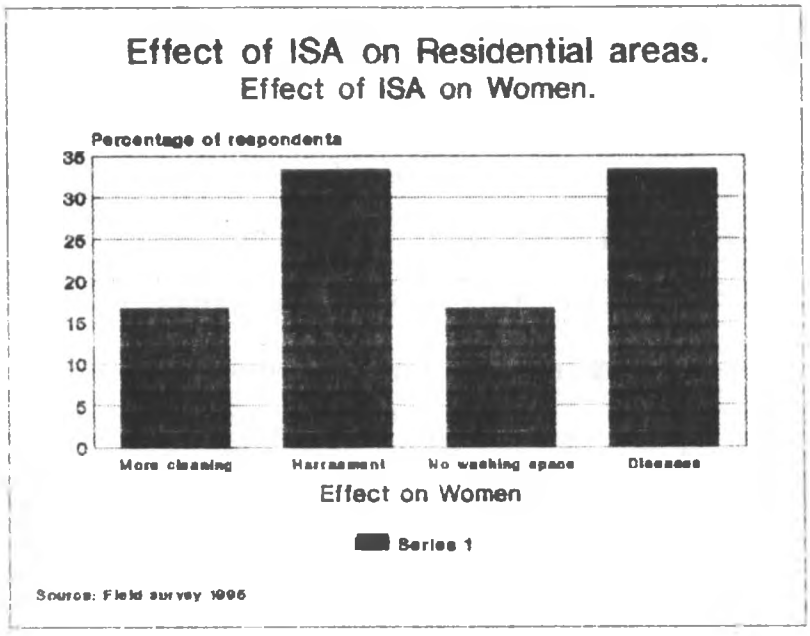


Fig. 4G.5 The effect of ISA in residential areas women.



4.6 Participation of ISA operators in environmental management:

The objective addressed under this analysis is to assess the possibilities of involving ISA operators in environmental management.

This objective was answered using a research question that "the environmental conditions in the informal sector activity areas can be greatly improved if the activity operators are made part of the urban environment management team".

Using the above research hypothesis, information and suggestions on how to improve the ISA environment was obtained from the ISA operators themselves, the ISA buyers. The ISA operators were also asked to suggest on how they thought they could participate in environmental Management; together with members of the general public.

ISA buyers thought they could participate in urban environment management by way of voluntary cleaning services, by the general public, and avoiding littering when they buy their goods from the ISA operators.

Members of the public thought they could participate as indicated in table 4.5 below.

Table 4.5. Participation of the members of the public in urban environmental management.

PARTICIPATION	PERCENTAGE OF RESPONDENTS
VOLUNTARY SERVICE	56.3
REJECT ILLEGAL LOCATIONS	18.8
NO ROLE	25

Source: Field survey 1994.

It was also established that members of the public,

especially those affected by the poor environmental state of ISA can organize themselves into self help groups, with cheap community based transport means that could reduce the nuisance of uncollected garbage. The public can be organised to play their roles by first creating public awareness through education, and then formation of community based environmental management organizations. From the study it was established that members of the public could be organised to play a role in environmental management as shown in the table 4.6 below.

Table 4.6. Organization of the members of the public to play roles in urban environmental management.

PARTICIPATION	PERCENTAGE OF RESPONDENTS
GARBAGE TRANSPORT	14.3
PUBLIC EDUCATION	42.9
SELF HELP GROUPS	42.9

Source: Field survey 1994.

The most serious constraint in enlisting the support of ISA operators and members of the public in environmental Management is the fact that they believe the service charge they pay to the NCC is sufficient to ensure efficient environmental management. This is particularly so in the CBD area where formal businessmen felt they could only participate in environmental management efforts if the service charge was

withdrawn. Indeed in the residential area, people are willing to tackle the poor environmental state since they have realised the NCC cannot solve their environmental problems. As for the members of the public, if they integrated by public awareness creation and education, they are likely to form self help groups to clean voluntarily their residential environment. From the household survey, 25% of the respondents, however, indicated that they had no role in environmental management. This indicates how difficult it might be to expect people who have paid for a service to render the service themselves in the presence of crumbling infrastructure.

From the above analysis of the study findings, it can be concluded that the locational characteristics of the micro enterprises in the study area have environmental consequences. The environmental problems and health implications of the sites chosen by the ISA operators as discussed above present serious problems in the city environmental management side. Some of the problems affect other businesses that are formally licensed to operate in the study area especially in the CBD, while others affect the residents of residential areas encroached by ISA. The health problems that arise affect both the formal sector respondents and the ISA operators themselves. Solutions that can be sustained by the affected groups need to be found. The possible solutions are addressed in the following two chapters.

References

(1) Chiara and Callender(1980): Time saver standards; for building types (second edition) McGraw-Hill book company New York

(2) ENEP: Energy, Pollution, environment,and Health, printed by Benson, UK(1991

(3) Adebayo R.Y: Climate and human settlements; Integrating climate into urban Planning and building design in Africa, UNEP 1991, Nairobi.

4 Hardoy D.& D Satterwaite(1992): Environmental Problems in third world cities, F Publications LTD, London.

CHAPTER FIVE

Theoretical Arguments Emerging from the Data.

5.0 Introduction

This chapter amplifies the theoretical framework considered in this study. It gives an understanding of the full meaning of the human environment, and the likely effects of environmental problems in human settlements. It also gives the various environmental management approaches that are likely to work in the study area.It draws heavily from the results of the field work.

5.1 Environmental management approaches

Options for managing environmental degradation in urban areas correspond with it's basic causes and include efforts to focus on the cost effective approaches, mobilization of public support and participation and the improvement of provision of urban services.

Urban environmental management approaches should be based on the severity, economic and health costs and on the capacity of the available institutions to carry out the recommendations.If designed effectively the environmental

management efforts can influence the behaviour of both the public and private sectors thus improving environmental quality. For example, such instruments as taxes and user charges can be used to effect waste management and urban space use requirements.

In practice taxes and user charges have been used in both developing and developed countries. In France for example, local communities are responsible for collecting and treating solid and liquid waste. In developing countries it has been used in Liberia where residents of informal settlements pay the local authorities for sanitary services.

The effectiveness of the above discussed approaches depend on public awareness and participation both in the developing and developed countries. This then calls for mobilization of public support for environmental management.

5.2. Mobilizing public support and participation.

Participation often begins when concerned actors apply collective effort for environmental action. To lobby effectively, the most vulnerable groups like the urban poor must be made to understand the causes of the problems. Therefore mobilising broad support requires efforts to raise awareness.

To achieve awareness the public and other actors involved in environmental management need to learn about environmental options and enforcement solutions. Such awareness can be achieved through public information and outreach programmes, which will also create incentives for improved environmental services. The awareness programmes can be carried out by the local authority, nongovernmental organizations and community based organizations. The information should be directed at all levels of the urban society including small scale enterprises community based organizations and others who need to understand the effect of their actions on the environment and the available options for improvements.

5.3 Improving the operation of urban services.

Emphasis should be placed on upgrading the coverage and management of the urban infra-structure and services. Ensuring environmental protection requires complimentary urban services. For example the introduction of more piped water in Gorofani will require parallel investment in sanitation; improvement in solid waste collection should be accompanied with safe disposal while investment in unclogging the storm water drainage system will first require improved solid waste management to avoid the dumping of waste in the drains.

To increase the effectiveness of local institutions in the effective provision of environmental management support

services, it is important to first improve their governance. In the study area, institutional strengthening and sound management practices are needed to achieve expanded coverage of provision of services especially in low income areas like Gorofani.

One of the keys to effective environmental management is to develop the institutional and technical capacities of local agencies like the Gorofani community and the Nairobi City Council which is responsible for environmental infrastructure and urban services. The Gorofani community can be encouraged to fight environmental degradation through awareness on environmental management options and technical skills while the local authority needs technical and financial management capacities for effective provision of urban infrastructure.

5.4 Environmental comfort.

The word environment implies much more than the physical resources of the earth. It defines the total environment within which people live and work. This then means that it is no longer possible to make a distinction between occupational diseases and generally poor health, between health problems or environmental problems resulting from work and those that come from the general environment in which the work is carried on (GUNN, M.A. 1978).

For the purpose of this study, and explanations in this chapter, the word environment was used to refer to the whole of the sensory environment: Smell, sound and feel as well as look. Through our senses we interact with what is around us, and sense quality links us directly to many psychological, social and economic issues[9].

According to Bell, G. (1972), the aim of the city is to make man happy and safe. It is important to take account of contemporary man as a human being in general abstract conditions, and as an individual since in life, studies such as this one finally focus on individuals. It is important to look at man from every possible angle. It is necessary to look at the body and beyond the sphere of the body where there are several concentric spheres defined by man's senses (see fig 5.1). No sensation should be overlooked; sense of taste, touch, smell, hearing and sight.

Body senses, mind and soul are only partial aspects of man but they cannot be separated. They all operate together

---

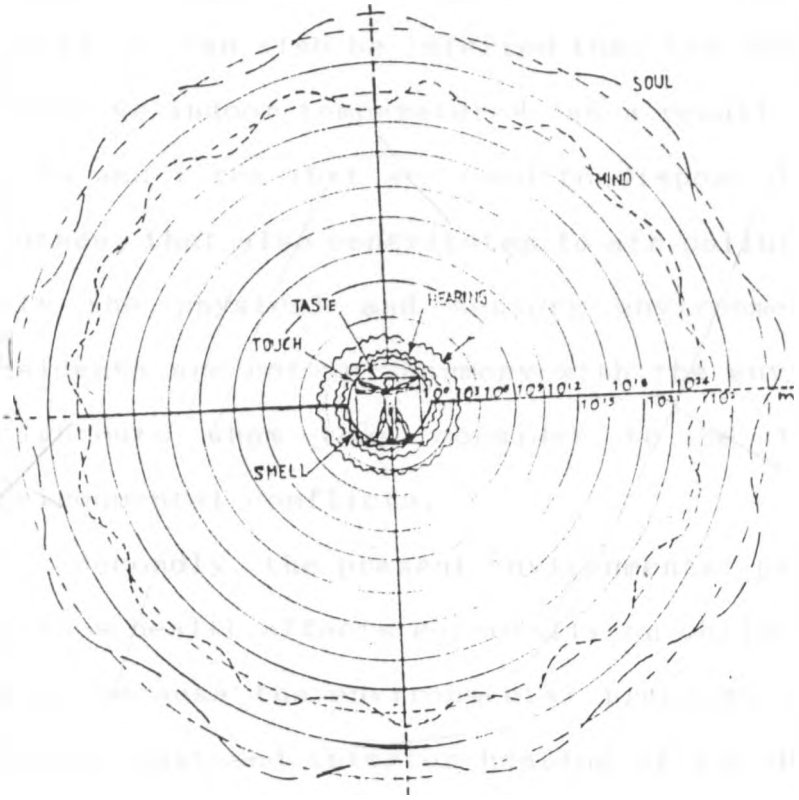
[9]. Laconte (1976, pg 261) argues that the primary factors influencing the environmental wellbeing of human beings are light and sound conditions, temperature, air movements and humidity, while Johnson and Kronvall (1991) add that a criteria for most ideal form of human settlement is that people be able to see well, feel and hear well. Sense deficiencies or overloads can prevent people's functioning or cause organic damage or, disturb people's comfort or reduce their efficiency. Many organic functions are affected by sense conditions: Motor actions of the body, body temperature and rythm including breathing and easing. All social communication and depend on sight and sound, smell and touch. Laconte concludes that a good environment therefore is one in which people can sense well, act completely and feel at ease.

in health and in sickness (see fig 5.1 below). The goal therefore of city planners is to work towards urban development that guarantees a harmonious development of all of man's elements.

Another important aspect of man's environment is happiness. This can be measured by the quality of satisfaction felt by man as seen in his different aspects. One can be very unhappy because of physiological or psychological factors. One can be equally unhappy if the senses suffer through noise smell and taste or through stress exercises on one's mind.Man's happiness depends on the alleviation of the stresses he is subjected to within his social and physical environment. Happiness can be achieved when man is in harmony with his physical world and nature, harmony with his neighbours (Bell 1972).

Happiness goes hand in hand with safety. Man's safety in the city can be assured through an analysis of all the five elements of man's totality (the Antropocosmos). Every single individual must feel and be safe which means that safety in a society can regulate personal and group conflicts within the urban environment. This leads to the concept of an urban system which will allow for different environments, offering all degrees of safety, ranging from the safe environment for children indoors, to the outside natural environment. An environment that can offer maximum safety and yet allow for a dynamic balance of man and the environment.

FIGURE 5.1.: ANTHROPOCOSMOS: THE TOTALITY OF MAN



(AFTER BELL G.T. 1972)

Relating the study findings to the above discussed theoretical argument, a number of issues are revealed about the study area. First, due to the fact that Gorofani is one of the residential areas fully encroached by ISA and the accompanying environmental conflicts, the residents are likely to have hearing problems mainly as a result of the high noise levels. It can also be inferred that the residents suffer from excessive indoor temperatures as a result of the ever closed doors and fires that are used to dispose disused second hand clothes, that also contributes to air pollution. This stresses with the physical and sensory environment mean that the residents are not in harmony with the environment nor their neighbours whom they consider to be the cause of the environmental conflicts.

Secondly, the present environmental problems can lead to serious health affects especially on children in future. This is so because the environmental problems such as high noise levels, dust and interior heating of the dwelling units are registered as environmental insults by the body of the affected child and come to affect the child in form of psychological problems in adulthood. This condition is made worse by the poor outdoor environment characterised by visual disturbance and lack of play space.

5.5 Elements of unsafe environment

Under this section, the study dwells on particular undesirable elements of the environment that constrain the achievement of a safe urban environment. Such elements as high noise levels, garbage and waste water are considered.

5.5.1 Noise:

Kronvall and Johnson (1991), define noise as undesirable sound. This indicates that the disturbances is not only due to the level and pitch of the sound but also to the activity which is disturbed and the attitude of the individual to the sound and its source. This study was hence concerned that urban residents are afforded the protection of an effective, practical and enforceable programme for the control of noise. From the study which was aimed at pinpointing the individual degree of concern with noise around his home or work place, a number of findings came out. First, it was established that transportation in the Gorofani residential area was a predominant noise source in the area. Another source was the micro-entrepreneurs themselves in their effort to beckon customers.

It was not possible to measure scientifically the levels of the noise generated but instead used the people's perception of noise in the environment. From the two sections

of the study area,all non informal sector respondents complained of the level of the noise generated as being too high. In both the formal commercial enterprises and the residential area the noise was said to be too high for comfort, for study and sleep. It was also established that noise levels are high from nine oclock in the morning to six oclock in the evening in the CBD area and throughout the day in the residential area. This means that high noise levels are a problem experienced over prolonged periods of time[9].

Taylor (1979) has given the recommended decibel levels in the urban environment as:- For bedrooms and living rooms, it should not exceed 45dBA during the day and 35dBA during the night. General offices need between 60-65 dBA range while small offices need 45-50 dBA. Private executive offices like in the CBD need 35-40 dBA. 80-85 dBA is suitable for light engineering works while 90 dBA is suitable for heavy industrial works. However Taylor continues to state that in all cases of annoyance and nuisance it is not the absolute levels of noise that is of concern, but the noise climate of

---

[9]. Bell. G T (1972), in his book entitled; The human identity in the urban environment, warns that prolonged noise disturbances can lead to ill health. Noise levels that are accepted as a matter of course bring about progressive impairment of hearing; pathogens that do not cause destructive epidemics because they are ubiquitous and have therefore elicited hard immunity can generate indigenous infections when resistance to them is decreased by physiological or mental stress. Very high noise levels are directly harmful to the hearing organs while lower levels can give rise to fatigue and headaches and sleep disturbances.

the environment. That is to say, noise is to be evaluated according to the surrounding.

The study was not able to measure in decibels the noise levels in the study area but was able to analyze the noise problem in the context of the environmental surrounding of the noise source. This was done both in the CBD where it was established that the noise made by Micro-entrepreneurs regardless of the fact that it might not have been too high for them, was a problem to the formal commercial enterprises who need much lower noise levels. The study also established that the noise made or caused to be made by Micro-enterprises at Gorofani was an environmental and health problem to the residents, given that some ISA engage in light engineering activities that have a minimum of 80-85 dBA while for residential purposes only 35-45 dBA is recommended. This means that the ISA at Gorofani then cause noise disturbances.

Noise disturbances during sleep, for babies has several effects over and above waking up as such. Among other things, changes in blood pressure, heart frequency, body movements and depth of sleep have been observed in other studies. There is also evidence of subjectively experienced inferior sleep quality and performance after sleep disturbed by noise.

From the study it was established that besides the noise being prolonged throughout the day, the noise levels are also high and thereby endanger the environmental and health wellbeing of the inhabitants of the study area.This is

especially so for children and women who spend more of their time at home and therefore get a heavier dose of the environmental problems

5.5.2 Garbage:

Creating too much waste can overtax the environment's waste absorptive capacity, and when waste is excessive it becomes pollution.

The consequences of overtaxing the urban environment's carrying capacity are invariably negative, destructive and costly. Some overtaxing consequences include environmentally induced illness.

Environmentally induced illness, here defined as those illnesses caused directly or indirectly by human alterations of the environment (Brown 1978 pg 57), now rank high among the world-wide leading causes of death and illness, among them cancer, heart disease and schistosomiasis.

Waste may be generated in the form of solids, sludge, gases and any combination thereof. Depending on the source of generation, some of these wastes may degenerate into harmless products, whereas others may be hazardous. Non-degradable wastes have cumulative detrimental effects.

The garbage generated in the study area is a heterogeneous mixture of wastes which are primarily of residential and commercial origin. The composition of waste

materials depend on the type of micro-enterprise.

The waste generated can have serious health problems if not collected. The collection and disposal of refuse in urban areas has been traditionally perceived as the responsibility of the local Municipal government. This is partly because garbage transportation has a large transport component, which requires a large investment in transport vehicles[10]. This can be afforded mostly by local authorities. Another reason for the solid waste remaining in the hands of the local authority is that no one else wants it. The delivery of service to collect and dispose garbage is given little status of priority.

Private organizations involved in garbage management, especially in low income areas,were interested in waste composting, and recycling. There are however five basic parameters which tend to limit the application of composting as a major method of solid waste management in low income areas like Gorofani. These parameters include; availability of land where the necessary facilities and site for composting would be installed; size of the community which makes it easier if the community is large enough to generate

---

[10]. Cointrean S J (1987) argues that provision of service to collect and dispose of municipal waste is expensive even when the most primitive methods are employed. It is not unusual for the cost to comprise 20 to 40 percent of the local authority's budget. This then explains why individuals and private organizations do not find it easy to offer garbage collection services in developing countries and poor local communities like Gorofani.

compostable waste of marketable scale, composition of the refuse which determines the percentage of how much of the waste can be composted and otherwise; need for secondary disposal for the type of waste that cannot be composted; existence of available compost market.

The garbage generated in Gorofani therefore remains on site due to the perceived high cost of collecting storing and disposing of the waste by private agencies, the composition of the waste which is mainly second hand clothing and vegetable wastes which have low recyclable materials and therefore attract no attention from private organizations. Collection is made even more difficult by the fact that the disposal habits of the ISA operators are uncoordinated which also leads to the garbage being thrown haphazardly in the study area. This makes collection even by the NCC cleansing department difficult. Garbage collection is also made difficult by the fact that the ISA operators have located on access lanes making it difficult for garbage collection vehicles to pass.

5.5.3 Waste water

Most Municipal refuse contains human faecal matter, and this could be attributed to inadequacies of the sanitation infrastructure and management.

When considering that human excreta is a critical vehicle for transition and spread of a wide range of communicable

diseases, municipal waste is a pathway for the pathogens contained in the excreta. A less direct route occurs also when vectors such as flies and cockroaches transport disease carrying agents in their intestinal tracts, subsequently contaminating food they contact. Furthermore pathogens and irritants leading to infection may be directly inhaled as wind transports fine-grained refuse materials. Residents in poor neighbourhoods also tend to compensate the unavailability of waste collection services by discharging their wastes in most convenient open ares or drains. This leads to the refuse clogging the drains and causing stagnant waters (see plate 5.1).

Plate 5.1. Stagnant waste water caused by clogged drains and broken sewer lines as a result of ISA activities in the study area.

Where the drains contain human sullage and faeces, there is a potential for culex peppiness and fatigans mosquitoes to breed in the stagnant waters and cause filariasis.

The study area, especially Gorofani is not spared the problems of clogged up drains and broken sewers that leave the area flooded with waste water. Drain clogging is mainly caused by the ISA operators who dump their garbage into the drains over which they have elected temporary business structures while the sewer breakages are caused by the heavy delivery vehicles used to transport ISA merchandise in the study area.

The clogged up sewers and drains can possibly lead to ill health for the residents since flies and rodents can transmit disease causing germs and contaminate human food and drinking water.

5.5.4 Air pollution.

Air pollution provides tragic evidence that many of the physiological, mental and social processes which make it possible to live in a hostile environment commonly express themselves at a later date in terms of diseases and economic loss. Adaptations to the stresses of the present often has to be paid in form of physiological misery at some future date. Even among persons who seem to be unaware of the danger of polluted air around them, the respiratory tract registers the

insult of the various air pollutants. Eventually the cumulative effects of irritation result in chronic bronchitis and other forms of irreversible Pulmonary diseases.

This state of ill health is very likely to affect the people working or living in the study area. From the study findings it was established that the air in the study area was polluted as a result of ISA which generated dust, smoke, bad smell, and chemical preservative fumes from second hand cloths.

5.5.5 Light and lighting

Good lighting is extremely important for well being and capacity for work. The amount of light must be sufficient, correctly distributed in the house and with the right direction. Daylight and provisions for looking out should be a necessary requirement for human well being. Windows should be located in such a way that they do not just let light in but give information about the world outside (Kronvall & Johnson 1991). The light and lighting situation in the study area, especially Gorofani is the exact apposite of the requirements above. The residents never get an opportunity to open their windows during the day because, from the outside, the windows are used as hangers for displaying second hand (MITUMBA) clothes. It is also the surest way to ensure that the waste and noise generated outside does not get its way

into the house. The residents therefore suffer under insufficient light, without an option of looking outside. This inturn decreases the amount of fresh air in the residential units and cause unnecessary heating of interiors of the dwelling units.

5.5.6 Thermal comfort

One condition for human life and health is that body temperature be close to 37°c. For this, it is necessary that the emission of heat from the body to the surrounding be kept in balance with the generation of heat in the body. Too high a temperature is known to give a feeling of dryness and is believed to cause tiredness and headaches.

At Gorofani, unnecessary heating of the dwelling units is generated in the process of burning rejected clothing in the residential area at night and ironing of second hand clothing within or just outside the dwelling units. This is made worse when the windows and doors have to be permanently locked to avoid other environmental menaces generated by ISA operators outside the dwelling units.

5.6 Conclusion.

It has been argued elsewhere in this study that man may be a victim of poor health largely as a result of his own

activities in the ISA areas. To avoid this likely situation then, the goal of urban planners is to create a humane city which acts as a home for man, with the goal of human happiness and safety. To achieve this, planners need to understand man better basing their understanding on wholeness, since the goal cannot be achieved by simple coordination of man's activities without looking at possible environmental nuisances as elaborated above. Planners can never solve environmental problems and tackle the associated diseases unless they conceive the whole of man's physical, social and sensory environment, in the context of how an overload in one of the aspects for whatever reason: economic or social can lead to ill health and therefore the underdevelopment of man.

REFERENCES:

1. GUNN M. A. (1978); Human settlements in an urban age, Published by Pregamon Press, OXFORD UK.

2. JACKSON B.W (1972) Only one earth; the care and maintenance of a small planet, Pelican books VICTORIA, AUSTRIA

3. BELL G.T. (1972): Human identity in the urban environment, Butte and Turn Limited, London.

4. Brown; L (1978) : The Twenty ninth day: Accommodating human needs and numbers to the earth's resources, W.W. Northon & Company INC. New York.

5. Cointrean S. J. (1982): Environmental Management of solid waste in developing countries; A project guide, urban development technical paper No. 5; World Bank, Washington D.C.

6. Cronvalle and Johnson (1991): Buildings and Health: Indoor climate and effective energy use.

7. Pierre, L(1992): The environment of human settlements; Human well being in cities.

CHAPTER SIX

Conclusions

6.0 Introduction

This chapter is devoted to conclusions arising from the field findings about the state of the environment in the informal sector activities. The chapter also examines options for environmental management aimed at alleviating environmental conflicts that arise from the activities of ISA operations in the study area.

The success or lack of it for environmental management in an urban environment that is supposed to promote or enhance the well being of its inhabitants must necessarily be determined by those persons whose well being is at stake. This is the basic guiding principle upon which all the recommendations and conclusions given hereunder are based.

The inhabitants of the study area whose well being is assumed to be at stake included both residents of the Gorofani estate which has been encroached with the ISA, the ISA operators both in the CBD and the residential area who operate under occupationally strenuous conditions created largely as a result their activities in unsuitable environment. They

also include the formal business operators in the CBD whose business premises suffer from overcrowding, obstruction, high noise and dust levels, garbage and other forms of nuisance created by ISA operators. Finally, they include the pedestrians who cannot make use of the walkways that have now been taken up by the ISA, leaving the pedestrians at the increased risk of conflicts with motorised transport.

The conflict that arise between environmental Management and informal sector activities could be best addressed separately for the two study area sub-regions. Thus recommendations that apply to the CBD might not necessarily apply to the residential area.

6.1 The central business district

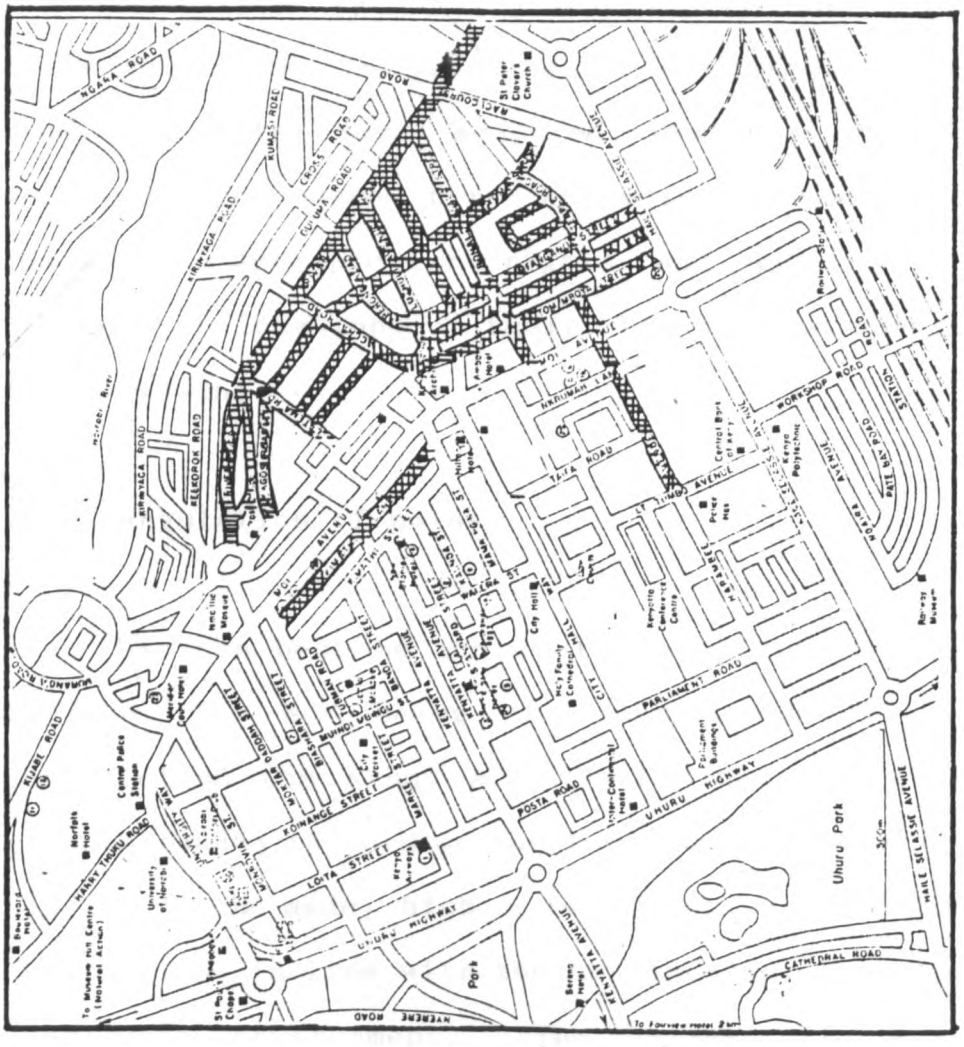
In Chapter two, it was established that the informal business activities in the CBD are not new in less developed countries. In Kenya they have been a problem since the early 1970s and according to Mochache (1990) evidence has shown that they are not a passing cloud. They are here to stay since this is where those who are not catered for in the formal sector find a livelihood. Tolba (1976) argues that an hungry man (the poor) know no environmental regulations. It will be futile then to suggest a complete removal of the ISA from the city centre since the ISA operators will keep coming back to the CBD until they find alternative ways of making a

livelihood.

It is on this basis that this study recommends that the informal sector activities in the CBD could be easier to monitor and regulate their impact to the environment, if they were formalised and allocated specific trading grounds, with particular regulations that ensure that besides them taking care of the environment, they also make economic sense. From personal observations, the study established that there are certain streets within the CBD where the ISA operators could be allowed to operate. The streets are considered suitable due their low traffic level, and due to the fact that most of them are not used for formal commercial businesses in the evenings and during the weekends. Such streets include unused backstreets within the CBD, that could be closed for the purpose of ISA only. These backstreets include the one behind Tom Mboya street that runs from Accra Road down to Ronald Ngala road. Others include one between Tom Mboya and Mfangano street, Dubois Road, Taveta Road, Duruma road and short street. Some of these streets can be used for ISA throughout the week, with regulations given below.

In the CBD, there are also streets that are busy during the week but could be closed down for motorists and left only to ISA activities. These must be streets that house premises that do not work on weekends. Such streets include the Agha-khan walk, Harambee Avenue, Haileselassie Avenue, River road, Monrovia street, and others as shown in map no.6.1. These

MAP NO. 6.1.: ISA GROUNDS IN THE CBD



RECOMMENDED ISA STREETS IN THE CBD

streets can be used especially from Saturday afternoons when formal shops have closed to Sunday, after which the ISA operators will be expected to go back to their regular streets given earlier.

To ensure sound environmental management in the areas suggested above, the following regulations and controls will apply .To address the noise level problem in the CBD the study recommends policies that could reduce the present high levels and control the ISA activities in away that will minimise noise in future. In adopting noise control regulations the study sought to take a measured, reasoned and effective way while at the same time extending maximum respect for individual entrepreneur rights and freedoms to operate business on locations of their choice. Such controls include the following.

6.1.1 Regulation of noise

This can best be achieved through use of Noise Control By-laws. The NCC being the local authority under whose jurisdiction the study area falls, has the constitutional responsibility to form or adopt bylaws that make the making or causing to be made, high noise levels in the CBD criminal. This will be in line with the non-informal operators right to unpolluted environment. The bylaws, if legislated and enforced in the ISA areas will reduce the noises to acceptable

levels.

The noise control by laws for the purpose of efficient enforcement should be left to a team of competent officers whose duty should include the investigation of noise levels on the trading streets and who will seek to solve problems concerning noise by counselling first, but if necessary can sue in a court of law, micro entrepreneurs who make noise when beckoning customers by use of whistles, bells or verbally. It will also discourage the use of equipments in ISA areas that will increase noise levels like hammers and electric machines, which should be located in areas outside the CBD, like the Gikomba cottage industries site.

Regulation of noise levels can also be achieved by regulating the hours of ISA business and therefore limiting the effect of noise on other urban activities. The limitation of hours of business can be used to minimize noise levels at times when other businesses and operations that are formally allowed to be in the CBD take place. This implies that the informal business activities could be allowed to operate from these sites in the afternoon (after 4.00 p.m.), but could operate throughout the day in the backstreets given above.

The regulations to counter noise generation in the CBD will have more effect if:

(i) By requiring that a licence be obtained before a certain micro-entrepreneur is allowed to operate from the allocated grounds.

(ii) By classifying certain conducts like the generation of high noise levels and failing to collect garbage generated at the end of the day unlawful.

(iii) By requiring the licence holders pay a certain amount of tax that should be spent in the cleaning and maintaining the trading grounds on suitable environmental levels.

Any attempt to control micro-entrepreneurs behaviour in these grounds must use one or all the above conditions. There is no reason why the harm caused by ISA operators to the environment through pollution of what ever kind may not be redressed through taxes and civil remedy. This is principally to compensate the local authority and the non informal sector operators, being organisations and individuals who are directly injured by the acts of the ISA operators, especially with the acts involving a risk of harm health wise.

6.1.2 Garbage and dust

Garbage and dust generation in ISA areas in the CBD go hand in hand. From the data collected, the Isa operators felt they could participate in the collection and storage of the garbage that arise from activities by organising themselves into particular street groups, that will share responsibilities of collection and storage with the NCC.

For the effective performance and success of this group, the study recommends that the groups to be formed take account

of four key factors in waste management in the CBD, that is; the collection options, transport choices; storage requirements and recycling. The factors will enable the groups to choose the best means to accomplish the tasks. Local transport possibilities have to be explored also. This will be successive if the groups approach the Nairobi City Council and arrange for transportation of the garbage collected by them for disposal.

Storage should be arranged to reduce nuisance and fly breeding and facilitate secondary collection for disposal by the NCC. According to an HABITAT publication, in the city centre, a high degree of paper collection exists. Scavengers have fixed places (street corners, parking lots) to which office people bring used papers. This fact demonstrates that collection and transfer of garbage by individuals to designated places in the city centre will certainly succeed if tried. However for effective waste storage and nuisance control, the mobility of the travelling salesmen that micro-entrepreneurs are must be reduced. This should not be difficult once the micro-entrepreneurs are assured a trading space in the CBD and have been encouraged to settle in the recommended streets. This is where the formation of trading groups and official registration of the micro-entrepreneurs for purposes of tax and space use fee will come in to control the mobility of the ISA operators in the CBD.

The financing of garbage collection, transport and

storage can be done through taxation of the ISA operators, and a subsidy from NCC in terms of transportation. Group waste disposal, which is most concerned with primary collection of garbage generated by individual entrepreneurs, requires a choice between different collection methods or systems, which in turn determines the main financial requirements of the participating micro-entrepreneurs. The following collection methods can apply in the recommended micro-entrepreneur grounds.

(i) Kerbside collection. This requires that first, each licensed micro-entrepreneur be issued with a standardised refuse collection container which at the end of the day is placed along the Kerbstone for collection and disposal by the NCC cleansing department personnel. This will encourage the participation of individuals who might be difficult to manage in groups.

(ii) Communal depots: This should be located in fixed places, most suitably at the end of every trading street, where micro-entrepreneurs collect and deposit their wastes at the end of the day. It will be the responsibility of the NCC to transport this deposited garbage to disposal sites, since it will be too expensive for the micro-entrepreneurs to transport. Use of simple transport like handcarts could be allowed to transport garbage within a particular street only, which will reduce the need for motorised transport in micro-entrepreneur grounds.

For efficient management of the garbage in the recommended streets and he CBD in general, about a half of the non informal respondents underscored the role of public education on waste management in the city. Public campaigns and education are valuable for specific residents such as seasonal clean up campaigns - where residents are encouraged to participate voluntarily in the cleaning of the city centre.

There are also a number of items of information that could be communicated to the ISA operators and their users through education. Such information include the level of expenditure required to manage the garbage and therefore how much the people have to contribute, the schedule for pick up of collected and stored wastes, arrangement for special collection of bulky wastes, methods for making complaints, organisation of the system and future plans, and what is expected of every city dweller as part of the co-operative effort, and the economic and health benefits of a clean city.

Violation notices can be considered apart of the education process. If violation tag lists all practices that are not allowed with a space for checking the specific violation, the residents and users of the city centre learn the mistakes they have made and ones to avoid in future. The tag may even include some information on the reasons behind certain rules and bylaws.

The moving of the ISA operators to the above recommended trading grounds and the implementation of nuisance control

guide lines will reduce the problems of noise, garbage, dust, obstruction and insecurity from licensed formal enterprises. Secondly it will enable all the micro-entrepreneurs to make economic sense out of their businesses since they will not be harassed and have their goods confiscated by NCC askaris, but trade in an orderly and safe manner for them and their customers. This will in turn motivate them to observe environmental management regulations and help the NCC to provide the garbage collection services to their areas of operation. This will indeed ensure sustainable enterprise development and effective environmental management in the ISA areas; in the CBD.

6.2 Environmental management in the Gorofani residential area

As stated earlier in this chapter, success of environmental management efforts and strategies is best evaluated by the people whose wellbeing is at stake; and for this purpose the Gorofani residents.

From the survey, all non-informal sector respondents recommended the separation of residential and commercial activities in the study area. Following their recommendations, and data obtained from NCC public health department on the consequences of environmental pollution of the level discussed in chapters four and five, the study

recommends a separation of Informal Sector Activities from the residential area.To achieve this target, there are three main options. One, is to suggest that all entrepreneurial activities in the residential area be terminated and the operators relocated on other sites. Secondly, the residents of Gorofani estate could be moved to another area on the periphery of the city and thereby making Gorofani an ISA operation zone. Thirdly, is the option of facilitating the ISA and residential activities to exist alongside one another. For feasibility of implementation this three options have to be evaluated in the light of the capacities of the implementing agencies and the people whose wellbeing is at stake.

The ISA operators in the residential area could be moved to the Gikomba small scale industries site, just across the Nairobi river, and others relocated in the already existing open market places of City Park market, where a few unoccupied stalls were observed, the quarry road market and a few in the earlier recommended city centre streets.

The separation might however be difficult because most of the ISA operators in the area have constructed permanent structures like stores and stalls. it is also difficult when it is viewed in the context that these entrepreneurs constitute partly the urban poor who are out to make a living and partly the rich who apparently have the goodwill of politicians. This was demonstrated in the 1990 *Muoroto* ISA operators eviction that resulted in resistance from the ISA

and loss of live. The influence of politicians has also been witnessed in the Gorofani conflict during recent court hearings of cases filed by Gorofani residents verses ISA operators where the cases have been dismissed without proper legal explanations. This means that for the purpose of moving the ISA operators from Gorofani the implementing agency will have a major problem here.It is however not sufficient to bend health and sanitation standards for the sake of economic and political well being of a few people. It is unjustified when it is revealed that some health problems, especially for children can take a long time before they show symptoms. It is on this basis that the study recommends that it would not be proper to compromise the health and wellbeing of the future generations, just for the sake of economic and political gains to a few people who can be relocated elsewhere.

The option of moving the residents of Gorofani to areas outside the city might also be difficult to implement because of the fact that the implementing agency, that is the local authority will have to shoulder the responsibility of providing the land and the actual construction of the living units. This is going to be too expensive given that the MCC is currently facing financial problems owing to lack of financial allocations from the central government and International donors. Secondly this option is complicated by the fact that there are several other residential areas in the city that have been encroached by ISA activities. Moving the residents

of Gorofani to another site will imply that, in future, residents of such estates as Dandora, Kawangware and Mathare will have to be moved to create trading space for the currently expanding ISA in this estates. This will cost the local authority astronomical amounts of money and will indeed defeat the purpose of forward planning.

The third option involves the installation of infrastructure and reconditioning the housing units so as minimize the impact of ISA on residential activities and therefore facilitate an harmonious co-existence of the two activities. This then calls for the provision of co-existence support infrastructure such as the provision of adequate water for both residential and commercial activities, improvement and extension of the existing sewerage and storm water drainage system to avoid conflicts of use and disposal of water for residential and commercial activities. To reduce the problem of uncollected garbage from the study area, monies collected from micro-entrepreneurs in the form of taxes by the NCC during licensing should be used to ensure regular collection of the garbage by the NCC for disposal. The micro-entrepreneurs should also be encouraged to collect and store their garbage at selected central places for collection by the NCC.

Measures should be put in place to reduce the impact of the dust, noise and visual disturbance resulting from ISA to the residents. This can be achieved by first, regulating the

distance between the location of an ISA and a residential unit to a minimum of at least five metres. This will reduce obstruction of the ventilation and allow sufficient light in the rooms and therefore reduce unnecessary heating of the dwelling units. Other activities such as the ironing and burning rejected clothes within the residential area should also be discouraged and relocated at central places away from the dwelling units.

To reduce annoyance caused by dust and noise, will require that the dwelling units be reconditioned in terms of both dust proof and noise reduction techniques. This will involve the installation of sound absorbing ceilings, enclosure of the listeners; that is the residents by improving the walls and windows. It will also involve the minimization of noise production by the ISA operators by such means as legal instruments that will allow the prosecution of offenders. The use of heavy delivery vehicles that produce high engine noises should be discouraged in the study area.

Environmental management in the study area will not be complete until other important issues like the provision of recreation facilities and access road for residential use are taken care of. This will then require that all the storage and godown facilities for second hand clothe that are now in places that were originally planned for recreation be moved to a central place, possibly to the Gikomba small scale industrial site just across the Nairobi river. The land space

left will be enough for recreation and accessibility infrastructure.

6.3 CONCLUSION

Micro-enterprise development in the city is an important vehicle for the economic well being of the city. The micro-enterprise also helps to absorb the unemployed urban poor, and gives them a chance to make a livelihood. However, there is no better way of assessing the usefulness of the economic gains generated than linking them to health standards of the people involved and their neighbours. it also defeats the purpose of urban planning and zoning regulations if economic gains can be used to compromise planning goals as in case of Gorofani residential area. It is in this context then, that the above given recommendations were reached, that ISA operators be either moved to situations where they can make economic gains and leave Gorofani for residential use only, the residents be moved to another site or measures that could facilitate the coexistence of the two be worked out. The measures that could facilitate coexistence have been suggested above, in the sense that in situations where planning or zoning standards have to be relaxed, infrastructure should be put in place to cushion their effects on the environment. This is the essence of environmental Management.

BIBLIOGRAPHY:

Adebajo R.Y (1991: Climate and human settlements; Integrating climate into urban Planning and building design in Africa, UNEP Nairobi.

Alan.B. (1989): Poverty and the environment; Reversing the downward spiral. World watch Institute.

Bell G T (1972): Human identity in the urban environment. Gwen Bell and Jyrwhitt publishers.

Berry and Kates (1982): Environmental problems -aview from E. Africa. Massachusets, USA.

Brown; L (1978) : The Twenty ninth day: Accommodating human needs and numbers to the earth's resources, W.W. Northon & Company INC. New York.

Chiara and Callender (1980): Time saver standards for building types (second edition). McGraw- hill company, new york.

Cointrean S.(1982): Environmental Management of solid waste in developing countries; A project guide, urban development technical paper No. 5; World Bank, Washington D.C.

Cronvalle and Johnson (1991): Buildings and Health Indoor climate and effective energy use.

Crow and Thorpe et al (1988): Survival and challenge in the third world. Oxford university press

Dahmen E (1979): The economics of environmental management. Mcmillan press.

ENEP: Energy, Pollution, environment,and Health, printed by Benson, UK(1991

GUNN M. A. (1978): Human settlements in an urban age, Published by Pregamon Press, OXFORD UK.

Gunniff. P. (1979): Environmental pollution. John wiley and Sons LTD Inc, New York.

Hardoy. and Satterwaite (1992): Environmental Problems in third world cities, F. Publications LTD,London.

JACKSON B.W (1972): Only one earth; the care and maintenance of a small planet, Pelican books VICTORIA, AUSTRIA.

Mochache J (1985): A study of informal sector activities in Nairobi.A case study of cottage industries in Gikomba belt neighbouhood.

Mochache J (1990): Urban informal sector activities in Nairobi. A study towards urban planning policy and methodology in Kenya. (Unpublished Ph.D thesis, Cambridge, UK)

Njoroge T (1985): Planning for the informal sector in the CBD of Nairobi. (Unpublished masters thesis,University of Nairobi).

Pierre, L.(1992): The environment of human settlements; Human well being in cities in cities. Proceedings of the conference held in Brussels, April 1976, Pregamon press.

Republic of Kenya (1992): Sessional paper No. two on small scale enterprises and Jua Kali development in Kenya. Government printer, Nairobi Kenya

Timbelake. L.(1988): Africa in crisis. Earthscan publications LTD London

Taylor .R. (1979): Noise. Penguin books LTD

Tolba M (1982): Development without destruction, evolving environmental. International publishing LTD.

Sewell.G (1982): Environmental quality management. Prentice hall International, London

Theordre R (1966): Comprehensive planning for environmental health (Unpublished masters thesis)

UNEP (1979): Report on Non-governmental organizations on activities on environmental issues related to UNEP programmes.

Victor and Steel (1976):Municipal and Rural sanitation. MacGraw-Hill Inc. New york.

APPENDIX.

UNIVERSITY OF NAIROBI

DEPARTMENT OF URBAN AND REGIONAL PLANNING.

MICRO-ENTERPRISE DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT PROBLEMS IN NAIROBI

SECTION A: ISA OPERATORS QUESTIONNAIRE.

1. (a)Household size.....

   (b)Estate of residence.....

2. Please explain why you like trading from this particular street.

   .....

   .....

   .....

3. (a) Is this the most suitable location for your business?

   Yes..

   No...

   (b) If no to Q3(a) above, Please explain why?

   .....

   .....

(c) In your opinion what do you think could be done to improve this situation?

.....

.....

.....

4. Street traders have in the past been allocated trading grounds outside the city centre, but they keep coming back to the town centre.What do you think is the main cause of this?

.....

.....

5. Suggest possible solutions to this.

.....

.....

6. Estimate the size of your working space(m^2)

1 <1 2 between 1 to 2 3 between 2 to 3

4 over 3.

7. How would you describe the condition of your working space?

.....

.....

8. State the various constraints you face in operating the activities on the present location

1 Lack of working space.....

2 NCC planners eviction.....

3 Dirty environment.....

4 Other (please specify).....

9. Under what category does your business fall:

1Service.....

2Goods.....

10. If goods, what type?

.....

.....

11. (a) What type of wastes does your business generate?

.....

.....

12. (b) How do you dispose the garbage generated?.

.....

.....

.....

13. (a) Do you think the condition of your working space has in any way affected your business?

Yes.....

No.....

13. (b) If yes to 21(B) please explain

.....

.....

13. (c) Please suggest possible solutions to the above effects.

.....

.....

.....

UNIVERSITY OF NAIROBI

DEPARTMENT OF URBAN AND REGIONAL PLANNING

MICRO-ENTERPRISE DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT PROBLEMS IN NAIROBI

FORMAL COMMERCIAL AND RESIDENTIAL QUESTIONNAIRE

Zone .....

Street.....

Activity type .....

1. (a) What type of informal activity is located near your business?

Clothing.....

Fruits and vegetables.....

1. (b) What is the exact location of the informal activity?

On the entrance.....

Across the street.....

Next to the entrance.....

On the road pavement.....

Other (specify) .....

2. If your activity type is business, what is the effect of

the informal activities located outside (next) your premises, on your business?

.....

.....

(b) What are some of the environmental problems arising from the activity outside your premises?

.....

.....

(c) At what time of the day are those problems most intense?

.....

(d) Please describe the traffic movement at the most intense (for informal business) time of the day

.....

.....

(e) Who is responsible for the garbage generated

Ourselves.....

The informal business operator.....

The city council.....

(g) please indicate the type of waste generated

.....

.....

(h) What steps have you taken to solve the problems?

.....

.....

3. If your activity type is residential, please indicate the

various problems you encounter from the informal activities outside (rank them from the most acute to the least).

Dust.....

Noise.....

Insecurity.....

Garbage.....

Transport (Walkways)

(b) How do the above problems affect;

Women.....

Children.....

Men.....

4. Please indicate the position of location of the informal sector

1. Front

2. Rear

(b) Distance of location from your house in Metres

.....

5. What steps have you taken to solve this problems

.....

(b) Suggest possible solutions to the above problems

Relocation of this activity.....

Improve garbage disposal from site.....

Control noise levels.....

Housing management to put dust proof windows...

Other specify.....

6 (a) What would you say is the role of the public in environmental management especially in areas where informal enterprises are prevalent?

.....

.....

.....

.....

.....

6 (b) In your opinion how would you organise members of the public like your self to be involved in environmental management?

.....

.....

UNIVERSITY OF NAIROBI

DEPARTMENT OF URBAN AND REGIONAL PLANNING

MICRO-ENTERPRISE DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT IN NAIROBI.

INFORMAL SECTOR PATRONS QUESTIONNAIRE.

Zone.....

Street.....

Type of goods purchased.....

1. Please explain why you prefer to buy your goods, and not in the formal shops?

   It is on my way home.....

   The goods here are cheap.....

   I'm able to buy in small quantities.....

   Other.(specify).....

2. In case of fruits, or any other groceries please explain how you dispose of the peels or any other wastes.

   .....

   .....

3. (a) Do you think the informal business operators are an

environmental problem?

Yes.....

No.....

(b) If yes to Q3a, please indicate the environmental problems associated with the traders (list them from the worst to the least)

Garbage generation.....

Traffic congestion.....

Noise generation.....

Air pollution.....

Insecurity.....

Visual disturbance (specify).....

Other

4. Suggest possible solutions to the above problems

.....

.....

5. In your opinion, who should be responsible for alleviating you have listed; and what roles should each of the persons/organizations play.

Person/organization	Role
(a) sellers.....	
(b) The buyers.....	
(c) The city council.....	

(d) Other.....

6. Does the fact that your seller is an informal enterprise influence the way you manage garbage after you purchase your goods.

Yes.....

No.....

(b) If yes, how?.....

.....

.....

7. What in your opinion should be your role as an individual or the organization you represent in the management of the environment?

.....

.....

8. What do you think should be the type of involvement for members of the public in environmental management?

.....

.....

.....