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112/01282

ROLE OF INFRASTRUCTURE IN URBAN SLUM TRANSFORMATION

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Education and Training for the Real World

DECLARATION

The author hereby declares that the work documented herein is his original work.

This dissertation is submitted to the department of Urban and Regional Planning of the School of Architecture and the Built Environment, at the Technical University of Kenya , in partial fulfillment of the examination board's requirement for the award of the Degree of Bachelor of The Built Environment in Urban and Regional Planning.

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1 CHAPTER ONE

1.1 Introduction

The rapid urbanization and the high rate of population growth and influx into urban areas, results to overutilization of the available limited natural resources. Rural-urban migration is a major cause of population growth in urban areas. The urban populations in the developing world grew at a 3.35 percent rate annually between 1975 and 2007, the development rate of the rustic populace stayed steady at around one percent. As a consequence of this trend, in 2007 the world's the world's urban populace surpassed the rustic populace (United Nations, 2008).

A big section of the urban population in Kenya today are jobless or earn much less than they can spend, causing a rise in poverty levels. Some of these people end up in makeshift settlements in public or private undeveloped urban land.

In context to physical planning, space [land resource] can be referred to as the major over utilized resource in most urban areas. The urban population thus tends to encroach into the surrounding land use zones [urban sprawl] or squeeze into the available limited urban space. The result to the latter is formation of slums. Community facilities, (like health and education facilities) and utilities (such as water, energy, transportation, or telecommunications) are also over utilized in the case of slum areas.

This paper seeks to expound on over exploitation of infrastructure in slums and some workable recommendations to help improve the livability and sustainability of the slums. Infrastructure provision and improvement will help create opportunities and highlights on the potentials of the area of study to achieve sustainable development. For instance, improvement of accessibility, water, waste management and electricity can generally improve the livelihoods of slum residents as well as economic growth and environmental conservation.

1.2 Background to the problem.

Rapid urbanization and physical growth of towns are major development planning issues in developing countries, e.g. Nigeria, South Africa and Kenya.

Urbanization in the country is accelerated by natural population growth, rural urban migration and boundary extension and expansion. Overdependence on agriculture and poor performance of rural development is making small trading centers to urbanize faster due to reliance on urban-based activities for their livelihoods leading to demands in more urban basic and infrastructure services. The development has been experienced in the major urban focuses in Kenya including Nairobi, Mombasa, Thika, Nyeri, and Nakuru among others.

The uncommon urban development rate has showed itself regarding the development of a large group of urbanization-related issues. The major problems facing Kenyan urban centers include:

- Poor housing and neighborhood quality
- Weak and fragile local economic basis
- High rate of unemployment and ever-increasing level of poverty
- Social problems including crime, violence and juvenile neglect
- Deteriorating environmental conditions
- Serious shortage and limited coverage of basic infrastructure and services
- Weak institutional, management and financial capacity to deal with these problems.

The high rate of urbanization has created intense pressure on the already weak capacity of urban centers to offer job opportunities and basic infrastructure and services.

1.3 Problem statement

Generally, slum areas are characterized by overutilization of available basic infrastructure by the ever increasing urban population. Poor people are drawn to urban areas because of the available and diverse employment opportunities. Efforts to take up such opportunities all too often requires them to live in crummy conditions, in slums and shanties, and to endure inadequate services [like water, electricity, roads, health and education institutions], insecurity, and consequent social and political problems.

The available limited infrastructure is shared by the entire population causing degradation of both the infrastructure, environment and settlement quarters. The

unplanned growth of settlements in slums makes conventional service provision complicated and costly.

Poor quality and inefficiency of infrastructure, community facilities and amenities and public utilities is a major shortcoming on livability and sustainable development in Majengo slum.

Accessibility is amongst the major development limitations, since structures have encroached the road reserves. The road network in the slum is informal or rather unplanned and in poor condition and so is the trunk infrastructure.

Lack of proper electricity connection is also a major limitation that results to insecurity during the night. In many slums, residents illegally tap electricity from the main power lines which is highly hazardous since it may cause electric accidents.

Inadequacy of clean water and proper waste management is also a major problem experienced in Majengo alongside many other slums in the world. This results in environmental pollution and spread of various diseases in the society.

1.4 Goals of the study

- Creation of development opportunities by providing and improving infrastructure, like water provision and waste management, improved accessibility and electricity provision in Majengo slum.
- Identification of weaknesses, strengths and potentials to support sustainable development and improve the livability of the area of study.

1.5 Study objectives

1.5.1 Ultimate objective.

- To use infrastructure development to support the potentials of Majengo slum and improve development opportunities to the residents.

1.5.2 Specific objectives

- To improve roads & drainage systems
- To improve security lighting (urban masts)
- To enable environmental conservation though waste management.

1.6 Research questions

- What caused slum development in Majengo?
- What are the main infrastructure related problems faced on site?
- How has the Kenyan government dealt with slum upgrading in other places?
- How can upgrading Majengo slum promote both environmental conservation and economic development of Mtwapa town?

1.7 Study assumptions

1.7.1 General assumptions

- Spatial planning has not been conducted in Majengo slum.
- Information provided during data collection is appropriate and accurate to help in decision making during plan preparation.

1.7.2 Specific assumption

Provision of infrastructure and services will act as a foundation for settlement improvement, economic development as well as environmental conservation.

1.8 Significance of the study

The study will also contribute to the frontiers of knowledge by assessing the various factors that lead to growth of slums and prevention techniques that can be used both locally and globally.

1.9 Study justification

The rapid urbanization and the high rate of population growth, leads to rise in poverty levels especially in urban areas. This results to formation of slums to offer residence to the ever increasing population, which creates the need for approaches that will promote and enhance livability, resilience, regional economic competitiveness, safety and sustainability of urban areas. This study seeks to use infrastructure development to trigger the above changes in slum areas.

[1] The Cities without Slums activity was supported as a Millennium Development Goal. MDG 7 contains the dedication to guarantee environmental strength and a pledge to divide, by 2015, the extent of individuals without practical access to safe drinking water and essential sanitation. One of its urban aspects, Target 11, plans to have

[1] Cities alliance 2002 annual report www.citiesalliance.org,

accomplished a critical change in the lives of no less than 100 million slum inhabitants by 2020. Adoption of this goal by leaders and urban developers will help formulate targets and intercessions to enhance the living states of underestimated urban occupants.

Two late studies of the experimental writing (Agénor et al. (2006) and Straub (2008)) presume that the larger part of studies, covering a wide scope of nations, find that the load of framework resources positively affects the rate of economic development, with the largest impact coming from telecommunications, roads, and electricity networks".

Vision 2030; Kenya Vision 2030 is the new nation's improvement outline covering the period 2008 to 2030. It aims at making Kenya a recently industrializing, "center wage nation giving top notch life to every one of its natives by the year 2030".

The vision is based on three "pillars" namely; the economic pillar, the social pillar and the political pillar.

The economic pillar aims at giving flourishing of all Kenyans through a monetary improvement program went for accomplishing an average Gross Domestic Product (GDP) development rate of 10 % per annum the following 25 years.

The social pillar seeks to build "a just and cohesive society with social equity in a clean and secure environment".

The political pillar aims at understanding a majority rule political framework established on issue-based governmental issues that regards the guideline of law, and secures the rights and opportunities of each person in the Kenyan society.

The vision is a strategy that seeks to improve the livelihoods of Kenyans as well as the environment, through various policies; amongst them spatial plans. Preparation of spatial plans for Slum areas will help attain the goal of urban upgrading.

County government act; The objectives of county planning are aimed at ensuring harmony between national, county and sub-county spatial planning requirements as well as ensure productive use of resources environmental conservation, harmonize development of county communication system, infrastructure and related services and develop urban and rural areas as integrated areas of economic and social activity amongst others. This justifies the need for policies geared towards urban upgrading and development.

1.9.1 Direct benefits

The study will first seek to improve livability, safety among other immediate positive changes to the slum residents. Improved quality and supply of community facilities and amenities will also be among the benefits experienced in the area.

1.9.2 Indirect benefits

Economic growth of Mtwapa region is among the major indirect benefits anticipated after implementation of the workable proposed solutions. Mtwapa town experiences a 24-hour economy which may be further enhanced by developing the slums in the area.

Environmental conservation, creation of employment opportunities, improve the social class of residents are also amongst probable benefits.

1.10 Study scope

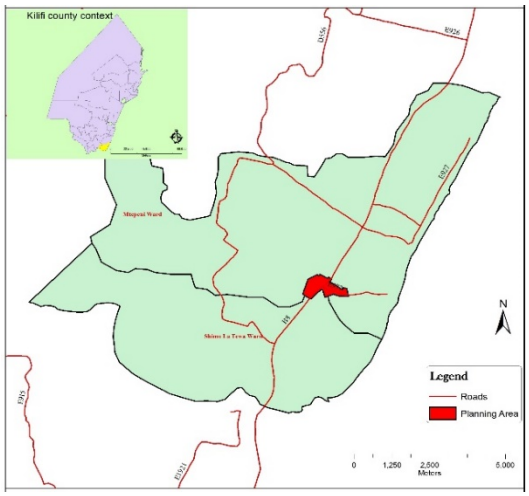
1.10.1 Theoretical scope

This study aims to show how provision of infrastructure and services like water, electricity, roads and drainage systems can transform positively the physical conditions and livability of slums.

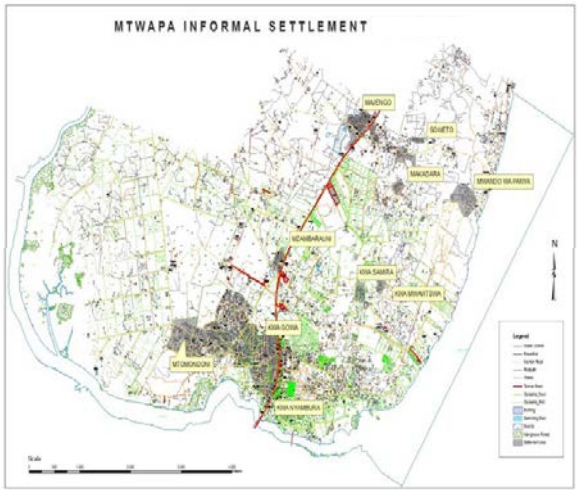
The study goals may be achieved through the 'Common Property protocols of management' strategy. The management protocols enable the maintenance of resources, since the various users act independently thus threatening the cumulative benefit from the common pool resource.

1.10.2 Geographical scope

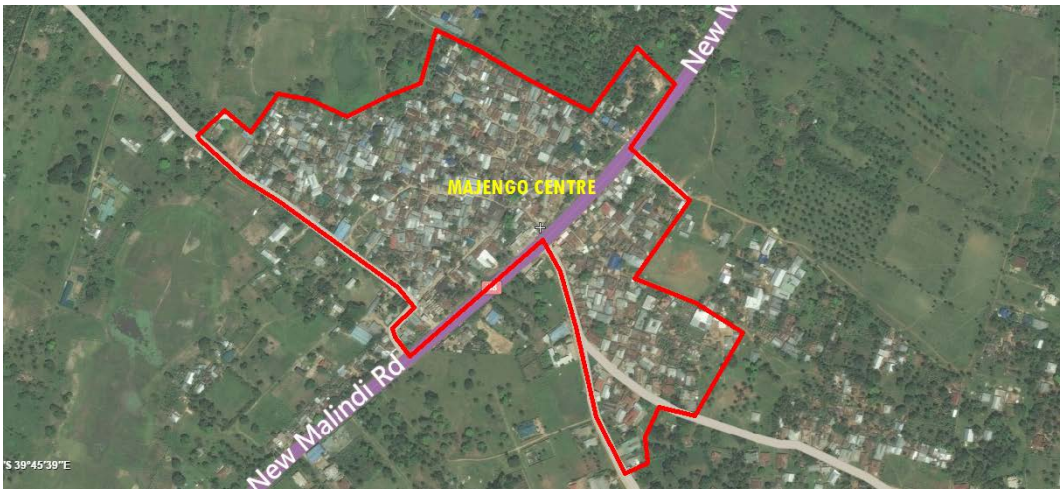
Majengo slum is located in Kanamai along the B8 highway, a few kilometers North of Mtwapa town, which connects major towns along the coastline.



Majengo town in Local context



Source; Mtwapa Integrated Strategic Urban Development Plan (2008-2030)



A satellite view of Majengo slum area, [2013]

1.10.3 Methodological scope

This entails explanation of the approach to be used in the study research. Data collection will involve household questionnaires, observation and use of archival data while analysis will mainly entail correlational study, since variables of infrastructure are closely related.

1.11 Study limitations

Inadequacy of accurate data is a major limitation in the study. Some of the data to be used is archival from earlier development projects of the study area.

Scarcity of time may also limit the work quality.

1.12 Study organization

This study is organized into chapters namely;

Chapter 1: Introduction

This chapter gives a description of the background to the problem, problem statement and the scope of study. It also contains the study objectives, significance and justification of the study.

Chapter 2: Literature Review

It entails critical review of relevant literature concerning previous slum upgrading interventions as well as outcomes of some of the interventions, both at a global and local perspective.

Chapter 3: Research Methodology

Research methodology addresses the methods applied in research. The methodology used to carry out this study include research approach, research design, research methods, sampling procedures, data sources, data analysis and presentation techniques.

Chapter 4: Study area and Case Studies

This chapter will expound on Mtwapa region, Majengo slum and adjacent slums histories and developments, legal and institutional framework and the prevailing physiographic and natural conditions.

Case studies on previous slum upgrading attempts, their successes and failures so as to inform on the decision making during plan proposal formulation.

Chapter 5: Data presentation and analysis

This chapter mainly deals with data presentations, analysis and findings.

Chapter 6: Conclusions and recommendations

This chapter contains implications, general conclusions and recommendations. Areas of further research are also discussed in this chapter.

2 CHAPTER TWO: Literature review

2.0 Introduction

According to UN-Habitat, a **slum household** is a group of individuals living under the same roof, lacking one or more of the following conditions (UN-Habitat, 2003):

Access to safe water: adequate measure of it (20 liters/individual/day), at a reasonable cost (under 10 percent of the aggregate family unit salary), accessible without being liable to great exertion (less than one hour a day of walking time);

Access to improved sanitation: access to an excreta disposal system, either in the form of a private toilet or a public toilet shared with a reasonable number of people;

Sufficient living area: fewer than three people per habitable room;

Structural quality/durability of dwellings: a house based on a non-dangerous area and with a perpetual structure sufficiently satisfactory to shield its tenants from the extremes of climatic conditions;

Security of tenure: the right to effective protection by the State against arbitrary unlawful evictions.

Slum upgrading comprises of physical, social, financial, hierarchical and natural upgrades to slums attempted agreeably and locally among citizens, group gatherings, organizations and local authorities. Legalizing and regularizing the properties in situations of insecure or unclear tenure is also fundamental.

[2]The main objective of slum upgrading is to alleviate the poor living standards of slum dwellers, by enabling accessibility to a healthy and secure living environment without being displaced. Many slums lack basic local authority services such as provision of safe drinking water, sanitation, wastewater and solid waste management.

Infrastructure refers to the fundamental facilities and systems serving a country, city, or area, [3]including the services and facilities necessary for its economy to function.[4] It regularly portrays specialized structures, for example, streets, spans, burrows, water supply, sewers, electrical networks, media communications, et cetera, and can be

[2]What is urban upgrading? -MIT [accessed 13th Oct 2015]
[3] Define Infrastructure at Dictionary.com
[4]Sullivan, Arthur; Steven M. Sheffrin (2003). Economics: Principles in action.

characterized as "the physical segments of interrelated frameworks giving items and administrations key to empower, manage, or improve societal living conditions."

Infrastructure development is among the workable solutions that can improve the livability and resilience of a slum. This entails improvement of water and sewerage systems, solid waste management, roads, electricity and communication services.

The United Nations (UN) estimates that nearly one billion people worldwide currently live in slums (one-sixth of the planet's population). By 2030, about five billion individuals will live in urban territories, contrasted with 3.2 billion in 2007. This quick and spontaneous urbanization raises the possibility of a relative increment in casual urban settlements, which will essentially expand the quantity of slum inhabitants and the social and natural issues that normally take after these convergences.

2.1 Slum formation and growth.

Slums fall into two broad categories: declining areas and progressing settlements – each of which can, for the purposes of expanded analysis, be broken into:

Declining areas: 'old' city center slums and 'new' slum estates.

Progressing settlements: squatter settlements and semi-legal subdivisions (as the case of Majengo slum).

For instance, most slums around Mtwapa town have resulted from squatter settlements and illegal subdivisions. The hinterland around the slums is characterized by agricultural farms. Small markets are gradually formed as central places for the farmlands. These markets do not have efficient infrastructure and public services to support the ever-growing population.

Growth of slums rely on upon different elements, for example, colonial legacies of town planning and administration, quick urban development, rapid country to-urban movement, worldwide monetary progression, advancement strategies, poor administration and 'absence of certifiable political will to address the issue in an in a general sense organized, maintainable and expansive scale way' (Habitat, 2003; 5), increasing urban poverty and inequality, population growth and globalization, corruption, inappropriate regulation, , broken area markets, lethargic budgetary frameworks to give low pay individuals essential public infrastructure and services (UN Habitat, 2003).

While more individuals are relocating from country ranges to towns and urban communities, urban zones are not sufficiently growing, there are insufficient standard houses, and municipalities are not having the capacity to give enough settlement. Subsequently, the in-transients are compelled to possess unlawful settlements on negligible grounds at the urban outskirts, along railroads and riversides, or on different risky ranges that is not reasonable for improvement prompting extension of slums.

Governance

Governments fail to recognize and acknowledge the rights of the urban poor and therefore do not include them in urban planning. It may not be entirely failure of governance, since not many cities can deal with rapid urbanization fast enough. People migrate into cities and build sub-standard settlements before the government is aware to include them in the planning process.

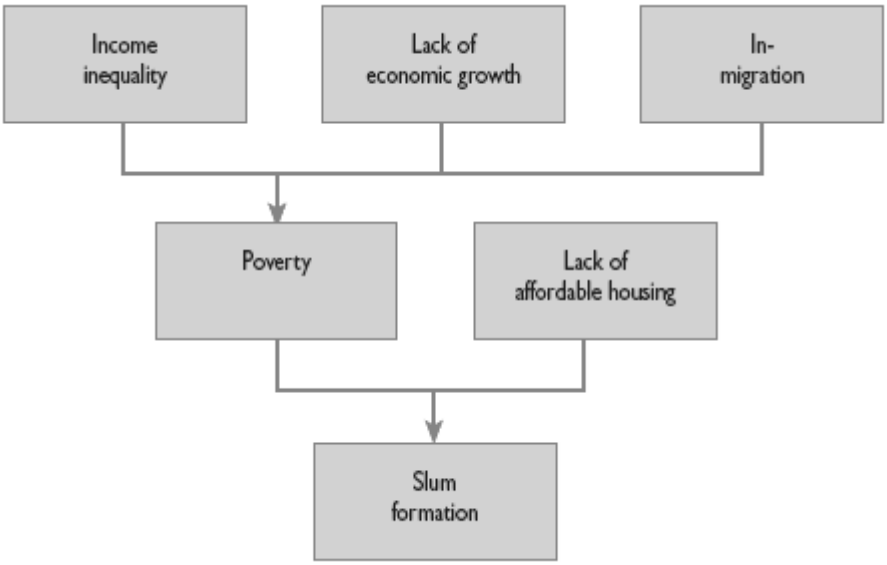
Slow implementation of policies also contributes largely to slum growth. Spatial plans may take up to 10 years before some proposed projects commence. By the time, population will most probably have multiplied beyond the carrying capacity of the proposed development project.

The attitude of a government towards urbanization also matters. Some believe that if they provide services to the urban poor, more people will move to towns. However, most people migrate to towns in search of employment and not in search of services like water and roads.

Population Growth and Rapid Urbanization

The existence and/or formation of slums are neither an inevitable consequence of population growth nor an inevitable result of rapid urbanization (Ooi & Phua, 2007; Taubenböck et al., 2009). One is to recognize that urbanization and further population growth is going to happen. urbanization is necessary for the wealth generation and economy of most nations. However, the benefits do not come suddenly; they need well-designed public policies that can lead to healthy economies, and ensure equitable distribution of resources. When public policies benefits only political or economic elites, urbanization will almost inevitably result in instability, as cities become unlivable for rich and poor alike (UN Habitat, 2010a).

the limited capacity of the local authorities to supply improved social and physical infrastructure services for the residents and in-migrants coupled with the rapid growth pace of urbanization and the actual trend of population growth are contributory factors to growth of slum settlements.



2.2 The Economic, Social and Environmental Challenges of Slums

Addressing the problems of slum settlements needs a better understanding of the physical development process of slum as well as recognition of its interrelated economic, social and environmental challenges.

As discussed by Gabriel (2007), slum expansion is not simply an urban planning problem, but a rather more complex and intractable phenomenon. The processes of slum formation are multidimensional in nature, often varying widely between countries and within countries and cities. Slum expansion is associated with the economic, social and environmental challenges.

In economic terms, slum settlements prompt considerable public and private investments, which remain outside of the formal economy and investment cycles (De Soto, 2003). Furthermore, they are correlated with large public sector costs, explicit and implicit. According to Tsenkova (2008), slum settlements often conquest public land, shifting the cost burden to local governments and public institutions. Slum settlements also impact on the government's ability to manage, monitor and plan land use. Owners usually do not pay property taxes or user fees, rather they often connect illegally to infrastructure, thus reducing the revenue available to government to provide basic services.

Slum settlements are a key element of the informal economy and real estate market. Since there is no tenure security in most of the cases, the investment is constantly under threat of being lost. For example, due to environmental hazards such as floods,

landslides, earthquakes or demolition in cases of road widening and other major infrastructure developments.

Informal practices remain the only affordable option for low income groups to access housing and land. Informal strategies play an essential role in supporting the livelihood of the marginalized groups (Tsenkova, 2008, p. 30).

It is important to explore the impact an intervention will have in the context of deprivation, vulnerability and fragile livelihoods.

According to Tsenkova (2008), the variety of spatial manifestations of slum settlements across the region is associated with several different social dimensions to the problem. Slum dwellers are often poor and disadvantaged facing unemployment, social exclusion and tenure insecurity. In several countries, one of the worst consequences of living in slum settlement is not the lack of secure tenure, but lack of access to basic amenities and social services such as schools, improve water and sanitation etc.

Slum settlements along with planning and management deficiencies affect the city's livability and environmental degradation at many levels and create environmental hazards through development in natural reserves and protected areas.

Result of lack of basic public services and facilities to sustain slum dwellers exposed them to many problems related to health (Alberti & Waddell, 2000). For instance, water-borne diseases, such as malaria, cholera, typhoid, and malnutrition, child mortality are common in slum settlements. There is also a wide range of social problems and psychological burdens on slum dwellers which often leads to homelessness and social exclusion. In addition, slum dwellers are prone to polluted and hazardous areas, for example, next to toxic plants, on areas threatened by landslip or waste disposal areas, flood, and environmental hazardous.

2.3 Slum Development Stages

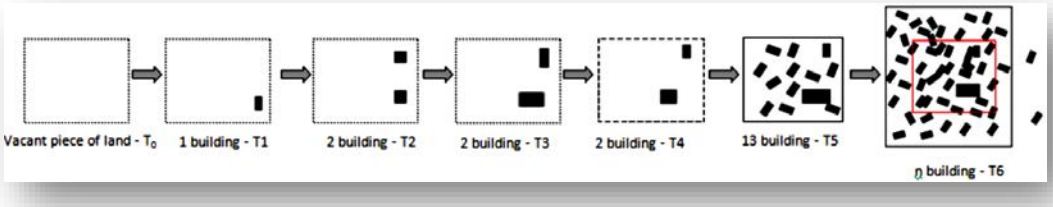
Eyre (1972) classified slums into four stages based on their characteristics; the initial occupancy, the transitional, the stage of attainable secure tenure, and the stage of absorption.

Miller (1965) classified slums into the same categories based on familial stability and job security (the unstable, the copers, the strained and the stable poor).

Turner (1966) classified slums into four in terms of development levels and security of tenure (the transient, provisional, incomplete and incipient, complete).

Recently, Abebe (2011) described informal settlements into three phase (infancy, consolidation and saturation) based on the availability of open space in the neighborhood; infancy is the starting stage at which 50 percent of the settlement area would be built-up, consolidation stage refers to booming stage at which up to 80 percent of the land would be used for housing construction and saturation stage is the stage whereby further construction is mainly continued through vertical densification.

The Figure below shows incremental and unstructured type of slum development process; however, there are other types of development also possible. Slum developments may happen at the expense of prime agricultural land, with the destruction of natural landscape or public open space. Every slum passes through various stages during its development. This process includes formation of various nuclei, expansion of older nuclei and intensification of the oldest (Agnihotri, 1994). The three stages of slum development are considered, namely, infancy, consolidation and saturation stages.



Source; (Sliuzas, 2008).

2.4 Objectives of slum upgrading

The general goal of slum upgrading is to improve the living conditions of slum residents living in the depressed physical conditions in urban areas on a sustainable basis and to prevent future slum growth.

Some of the specific objectives of slum upgrading include;

To develop affordable and participatory measures for upgrading housing conditions and related support infrastructure in slum areas

To plan and implement in collaboration with stakeholder programs and pilot projects to minimize, eliminate and curtail the growth of slums.

To harness central government's and urban authority (ties)'s resources in enhancing the contribution of slums to the urban economy.

To ensure an appropriate institutional framework and mechanisms for effective implementation of slum upgrading programs by different stakeholders.

2.5 Benefits of slum upgrading

2.5.1 Physical or environmental benefits.

It addresses overall issues by containing environmental degradation, improving sanitation, lowering violence and attracting investment.

2.5.2 Sociocultural benefits

It promotes inclusion by enabling the relevant authority to address serious issues like illegality, exclusion, inadequacy of public services, credit services, productive land, insecurity and social protection of vulnerable populations like women, children and the aged.

Improving the quality of life of upgraded communities and the surrounding city as a whole, providing more citizenship, representation, political voice, improved living conditions, safety and security.

Provides shelter to the urban poor at a large scale and at the lowest cost. For instance, on-site upgrading is usually effective since it is flexible {*can be done by the city and residents at a technically and financially possible pace.}*, affordable {*costs less and is more effective than relocation to public housing or developing land with basic services}* and viable *{since the poor may be willing and able to pay for some of the improvised services and homes}.*

2.5.3 Economic benefits

It promotes economic development by releasing the vast untapped resources of slum dwellers *{e.g. Labor, land, innovative ideas}* that have skills and a huge desire to be a more productive part of the economy, but are held back by their status and marginality.

2.6 Interventions of slum upgrading

Several countries have achieved, or are in the process of achieving, reduction or stabilization of slum growth rates. In Brazil, Egypt, Mexico, South Africa, Thailand,

and Tunisia, success is attributed to the political commitment to large-scale slum upgrading and urbanization programs, including legal and regulatory reforms in land policy and land regularization programs (UN-Habitat, 2006).

Improving the quality of life in informal settlements represents one of the greatest challenges that governments in developing nations face. Various approaches that have been undertaken to deal with this problem include;

Programs aimed at improving living conditions, mainly through slum upgrading but also through public housing and sites and services projects, providing access to credit and housing finance, land-titling, infrastructure improvements, and utility subsidies

Programs aimed at improving the income of the poor, such as job training and microenterprise development.

Alternative slum upgrading strategies include provision of basic services, effective land management, rent controls, micro-enterprise development, and social development. (Basil Van Horen, 2004)

2.6.1 [5]**The eradication strategy** or **the site and service scheme**

It proved to be expensive (assuming that governments were able to provide homes for the displaced population) and socially disruptive, but it is still practiced in some countries.

It was popular in the 1970s that involved provision of urban plots for families that were removed from slums, so they could build their homes. It was however criticized for being incomplete and for leaving families in generally worse conditions than they were in the original slums.

2.6.2 **In-situ slum upgrading**,

However, keeps the social networks of the dwellers and the cohesiveness of the community intact while improving their living standards (Abdenur, 2009).

The success of this approach led to the implementation of a variety of programs, starting with those that dealt only with land tenure and ranging all the way to fully integrated programs in more complete versions, which include the provision of infrastructure, urban services, housing improvement, and other attributes (Brakarz et al., 2002).

[5] Evaluation of Slum Upgrading Programs, Laura Jaitman and José Brakarz

In a city that aspires beauty and competitiveness, *in situ* upgrading of informal settlements (rather than complete demolition and redevelopment) remains a hard-won exception (Huchzermeyer, 2011).

Moreover, [6]Slum upgrading consists of physical, social, economic, organizational and environmental improvements within neighborhoods. These projects may be undertaken by citizens, community groups, businesses, and local and national authorities.

Typical actions include:

Regularizing security of tenure through property mapping, titling and registration

Installing or improving basic infrastructure, including water, waste collection, storm drainage, electricity, security lighting, and public telephones.

Removal or mitigation of environmental hazards.

Providing incentives for community management and maintenance.

Constructing or rehabilitating community facilities such as nurseries, health posts, community centers.

Home improvement, including material upgrading, new construction, and expansion of existing structures.

Improving access to health care and education as well as social support programs to address community issues such as crime and substance abuse.

Enhancement of income-earning opportunities through training and micro-credit.

Crime control.

2.6.3 Community participation.

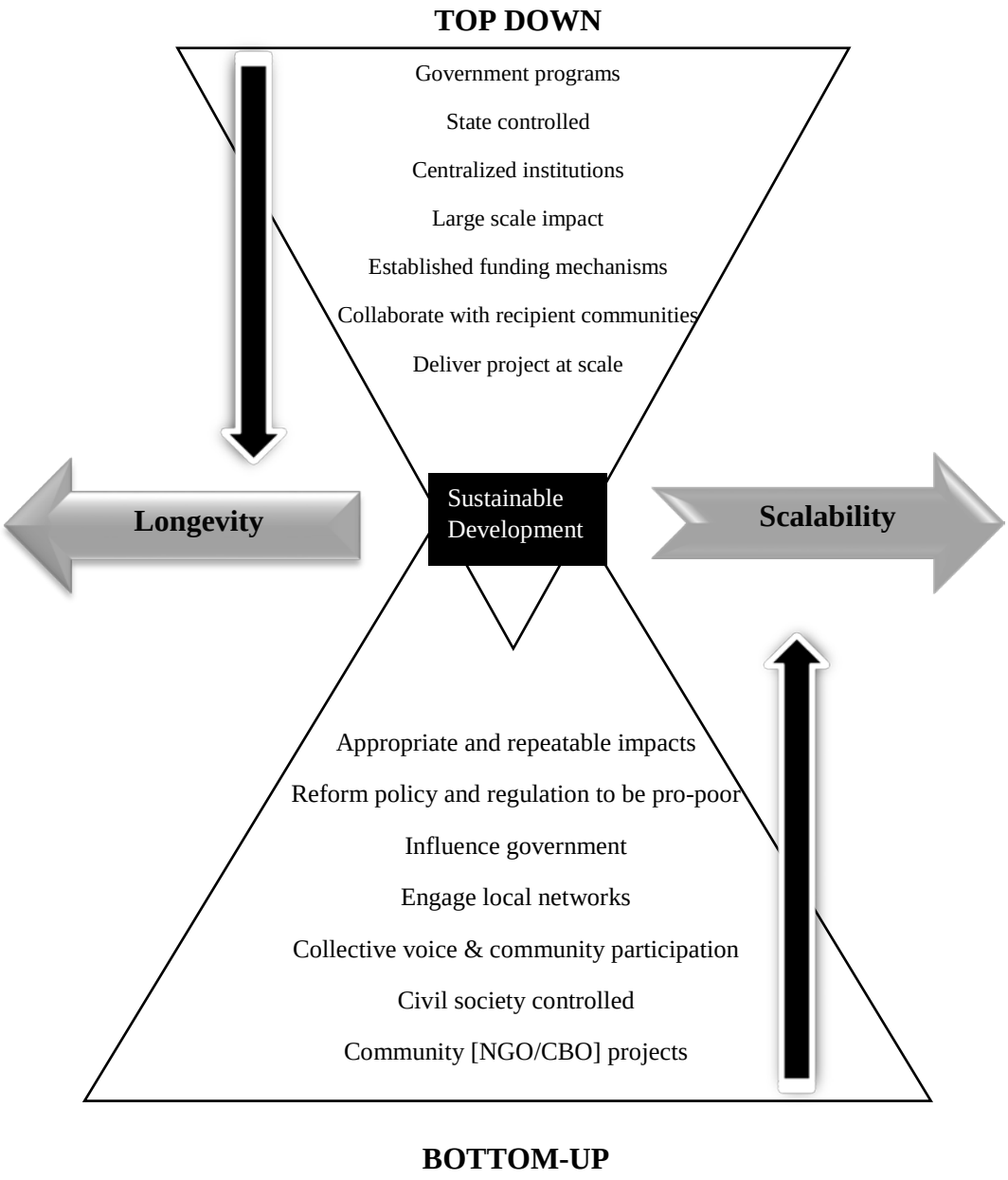
[7] Victoria Hickman's approach on slum upgrading involves numerous housing delivery systems. Adaptive and proactive measures implemented to tackle slum development, with limited investigation of the longer term sustainability of such

[6] Impact Evaluation for Slum Upgrading Interventions, October 2006
[7] Alternative approaches to sustainable slum upgrading in Kenya; Victoria Hickman - Centre for Sustainable Development, Engineering Department

interventions and Multi-sectoral partnership approaches that involve external actors who plan and implement a project, successfully engaging with the community and facilitating participation.

Community participation supports the success of long term projects and integrated approaches that improve livelihoods as well as the physical environment.

Generalization of **'top-down or centralized'** and some as **'bottom-up or decentralized'.** Each has an alternative delivery method and can result in a sustainable development.



City wide programs which engage with **government**s to ensure state control of the upgrading while seeking to reform centralized, institutional structures that enable the scalability of a program to reach the maximum number of beneficiaries.

Individual community level. External actors such as NGOs work with the community to support the formation of community based organizations to represent and strengthen the voice of the poor with an aim to **influence** governments to take notice of their constituency.

[8]*Cities alliance for cities without slums* formulated an action plan for moving slum upgrading to scale, that outlined the below workable strategies necessary to meet the goal of slum upgrading;

Strengthening in-Country Capacity by: restructuring policy, regulatory, operating frameworks, and legal/ technical constraints to upgrading at scale; overcoming institutional bottlenecks; encouraging local commitment and resolve, including political understanding and buy-in; and, strengthening learning and training.

Preparing National/City Upgrading Programs by helping committed countries design upgrading programs to scale.

Supporting Regional and Global Knowledge and Learning that capture and share the varied approaches and local practices to get the job done better with the full involvement of the affected communities; organizing networks of practice; fielding specialists to help countries and cities move to scale.

Investing in Slums with appropriate basic infrastructure and municipal services identified, implemented and operated with the community.

Strengthening Partner Capacity to focus attention on the task, with emphasis on the resources, knowledge and tools to help governments and communities do the job well and at scale.

Leadership and Political Buy-in by the partners of the Alliance to prioritize slum upgrading.

2.6.4 Slum upgrading with civil society {Quezon City, The Philippines}

In the Philippines slum upgrading has been a mix of national and city government initiatives, civil society involvement and international donor agency support (Lee, 1985). City governments have offices whose roles are dedicated to slum upgrading, housing construction and the related concerns of their urban poor constituency.

[8] Cities without slums action plan [*Web.mit.edu/urbanupgrading/sponsor/actionplan*]

Slum upgrading is a key strategy in national poverty alleviation pursued through relocation and resettlement but civil society is heavily involved in partnership with government. Two pieces of national legislation provide the context for both slum upgrading and social housing: The Local Government Code (LGC) of 1991 and the Urban Development and Housing Act (UDHA) of 1992. The LGC devolved considerable powers and responsibilities to local governments, including that for providing basic services. It supported the participation of civil society groups in governance.

The UDHA addressed multiple urbanization concerns, including the provision of land tenure and housing for the urban poor, and promoted public participation in the development process.

2.6.5 Other interventions.

[9]Delivery and improvement of shelter in low-income settlements, which is closely related to security of tenure, can be an important policy instrument to facilitate slum upgrading. This may be linked to the upgrading of physical infrastructure (roads, water, sanitation, garbage removal, drainage, electricity) and social services (health, education, recreation and community facilities).

It is also necessary that adequate local government resources be allocated to ensure ongoing maintenance and improvement of these basic services for the urban poor, and that local government reforms be instituted in order to ensure legal and regulatory frameworks that are supportive of ongoing improvement of urban low-income settlements.

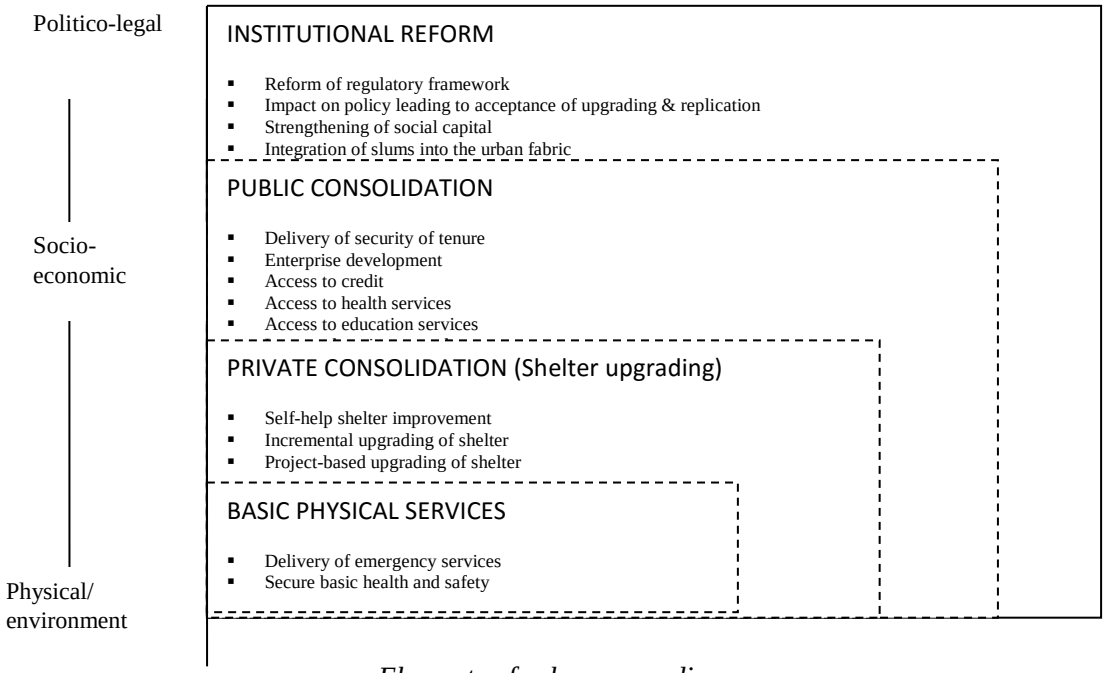
Approaches to community upgrading range from a narrow focus on the provision of basic physical services (Silas 1984, 1992), through to broader approaches that integrate socio-economic development, regulatory reform, and attempts to contribute to city-level institutional change (van Horen 2000, Pamuk and Cavallieri 1997).

Comprehensive approaches to upgrading also include the building of a local economic base through the development of relevant knowledge and skills, and strengthening organizational relationships between community organizations and supportive NGOs and local government structures. The more advanced approaches to upgrading also

[9] Upgrading paper- Basil Van Horen ,2004

involve the reform of governance structures with a view to putting in place more supportive institutional arrangements.

The most useful approach is one that also includes changes to urban governance so that community capital can be maintained and improved over the longer term. The possibilities are described through the hierarchy below.



Elements of urban upgrading

Source; Basil van Horen (2004)

[10]Many emerging markets and most low-income countries require a major step increase in infrastructure investment to alleviate growth constraints, respond to urbanization pressures and meet their crucial goals for inclusive growth, development, and sustainability.

There is a well-documented infrastructure deficit in many developing and developed countries, which is hampering growth prospects. Strategic infrastructure, from roads and ports to energy, needs to be built to fuel growth. An estimated 1.4 billion people still have no access to electricity, 0.9 billion are without access to safe drinking water and 2.6 billion without access to basic sanitation. These deficits continue to pose substantial challenges in low-income countries, but there are also pervasive deficits in many middle-income countries.

[10] Infrastructure for development: meeting the challenge - Amar Bhattacharya, Mattia Romani, and Nicholas Stern. (June 2012)

2.7 Outcomes of slum upgrading programs, Global perspective

Various worldwide organizations have tried to formulate policies to curb informal settlements in urban areas globally.

According to 2010 MDG summit, [11]Successful slum upgrading programs include:

Mobilizing key stakeholders, including local authorities, civil society, local communities and the private sector, to collaborate in the provision of services that both enhance the quality of life in the slums and create employment and business opportunities.

Sound urban planning and making urban areas resilient to emergencies and disasters.

Incorporating rural development strategies into the framework for improving slum dwellers' welfare can reduce pressures for rural-urban migration and address other rural-urban linkages.

Ensuring participatory governance and community development. Compiling lessons learned and sharing for others to use. Ensuring the security of tenure and women's rights to land, property ownership and inheritance.

2.7.1 [12]Indonesia: slum upgrading in the National Development Plan

In every National Development Plan since the 1960s slum upgrading has been a key part of Indonesia's strategy for poverty alleviation.

There have been three instances of these policies;

The **Kampung Improvement Program (KIP)** initiated in Jakarta in 1969 has been called "the world's first slum upgrading program" (Juliman & Durrendon, 2006). Funded by the Jakarta City Administration and the World Bank, the KIP focused on ***improving physical conditions by providing basic infrastructure and upgrading housing*** (Tunas & Peresthu, 2010).

The second instance approaches ran from the late 1980s to the early 1990s. They attempted ***to integrate physical, social and economic improvements***.

The Asian financial crisis of 1997 forced the government into a third generation of programs to deal with the sudden escalation of levels of poverty. This included; The

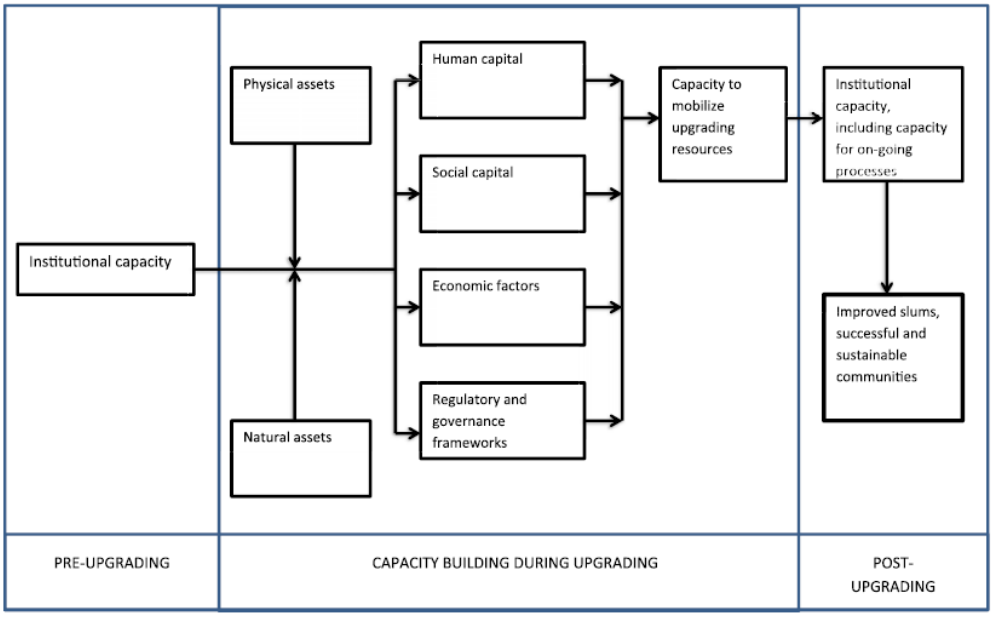
[11] Keeping the Promise: Outcome of the 2010 MDG Summit

[12] Slum upgrading and urban governance: Case studies in three South East Asian cities - John Minnery, Teti Argo, Haryo Winarso, Do Hau, Cynthia C. Veneracion, Dean Forbes, Iraphne Childs

JPS Jaring Pengaman Sosial (Social Safety Net) and **P2KP Program Pengentasan Kemiskinan Perkotaan (Urban Poverty Alleviation Program).**

These programs integrated physical, social and economic improvements but also incorporated livelihood enhancements. The strategy was formally included in the National Medium-Term Development Plan 2004-2009 (Government of Indonesia, 2005).

All three generations of slum upgrading in Indonesia were initiated at the national level with local government reacting to and implementing national initiatives.



Ingredients required for institutional capacity building. (Source: Modified from Antolihao and van Horen (2005),

The most significant achievements during upgrading have been in terms of physical capital (infrastructure and housing) and in some cases community capacity building (social and human capital), while the post-upgrading phase has been the least successful. In some cases, major gains were made in access to more secure forms of land tenure.

[13]Early assessment of the Bandung projects (Wilhelmus Hofsteede Consultants, 1980) was generally favorable. The financial crisis of 1997/8 brought problems to cooperatives. Many were unable to repay their loans and were forced to close. The P2KP **(Urban Poverty Alleviation Program)**, aimed at enhancing the productive assets of the communities, was implemented across Indonesia in response to the

[13] Lessons from Bandung; Slum upgrading and urban governance: Case studies in three South East Asian cities - John Minnery, Teti Argo, Haryo Winarso, Do Hau, Cynthia C. Veneracion, Dean Forbes, Iraphne Childs

economic crisis. By 2007, however, of the 134 *Kelurahan* (urban communities in Indonesia) that received a P2KP project in Bandung, less than 30% were still able to manage their activities (Tampubolon, 2007).

Generally, community capability to maintain the results of upgrading was not achieved.

There has been a longer-lasting physical and social legacy from the earlier physical-focused upgrades. The early UNEP-experiment in Bandung successfully promoted the building of social assets in the community through the establishment of cooperatives and integrating construction with 'on the job' training. A possible reason for its lasting legacy is that there was no ambiguity in how funds had to be spent. All funds were focused on physical upgrading, including training efforts. Later programs tried to address physical, economic and social conditions, but the available funding was not commensurate with the expanded purposes. The top-down approach also meant that community participation was poorly developed; the lack of clear community purpose hindered the retention of both social cohesion and economic opportunities (RTPP, 2008).

2.7.2 Quezon city[Philippines] slum upgrading program

[14] Politically active groups, in slum upgrading in the Philippines, include community-based organizations, family and corporate foundations, socio-civic clubs, faith-based groups and other non-government organizations (NGOs). A dynamic NGO community has increasingly been viewed as a major conduit of international financial assistance to urban poor communities, including funds from the World Bank and the Asian Development Bank. NGOs have aided urban poor communities in gaining basic services, improved physical infrastructure, land tenure security and in providing leadership training. Civil society groups have demonstrated their strong capability to mobilize resources in contributing to urban upgrading needs.

The experiences of the communities studied in Quezon City provide evidence that acquiring improved tenure security and better physical infrastructure can transform informal settlements.

The increased sense of security can inspire residents to upgrade their own housing conditions. In Dormitory, Golden Shower, and Brookside-3 external funds enabled the

[14] Lessons from Quezon City; Slum upgrading and urban governance: Case studies in three South East Asian cities - John Minnery, Teti Argo, Haryo Winarso, Do Hau, Cynthia C. Veneracion, Dean Forbes, Iraphne Childs

physical upgrading of sites and housing to the extent that these three communities are no longer tagged as urban slums. Maintenance of loan repayments, however, would be problematic if livelihoods failed. Land tenure and finance availability dominated concerns in these communities.

The slum upgrading experiences in various cities globally, were very mixed in terms of outcomes. The most significant achievements have been in terms of physical capital (infrastructure and housing) and in some cases community capacity building (social and human capital) during upgrading, while the post-upgrading phase has been the least successful. In some cases, major gains were made in access to more secure forms of land tenure. Some social capital experiments, albeit short-term, showed promise as effective future models for community engagement. The longer-term economic improvement necessary to lift slum residents out of poverty permanently, however, has remained elusive.

2.8 Outcomes of slum upgrading programs, local perspective

Kenya, just like some other developing nations, is faced by the problem of informal settlements especially in the urban areas. Various strategies have commenced in an effort to curb the menace of slums. However, some of these strategies are not well formulated and end up not solving the issue in question. Lack of Community participation being among the major failures of the project thus compromising the workability of the projects.

2.8.1 UMANDE Trust's Bio-Centre initiative

[15]UMANDE Trust is a non-profit organization that is currently providing upgrading initiatives in

Kibera and other informal settlements in Kenya through the provision of sanitation in bio-centers, which provide sanitation and produce energy which can be used by communities.

The Trust works with registered Community Based Organizations who have savings accounts in order to boost their income generation. Upon completion of the bio-center construction it is left to the CBO to manage and maintain. This is how income generation is boosted.

Members of the community pay 5 Kenya Shillings for the use of the toilets or can opt for a monthly fee of 150 shillings. The bio-centers consist of toilets, bathrooms,

[15] Slum upgrading initiatives and its impacts on livelihoods, Reflections from Nairobi -Pumla Bafo (10/1/2012)

community halls, bio-gas unit or kitchen, community library, kindergarten, water kiosk.

Income generated from the various uses in the bio-center is split, whereby 50% goes towards members' dividends, 30% goes towards maintenance and operation of the bio-center and 20% goes to The Sanitation Development Fund (SANDEF), which is a pool of revolving funds for all bio-centers that have been constructed by the trust (Umande Trust, 2012).

Some of the on-plots toilets which were provided by Landlords, have been linked to the bio-center at an additional fee. The trust is currently embarking on the establishment of post treatment centers which will not only address the challenge of full bio-centers but also separate waste and recycle it for compost.

2.8.2 Kenya Slum Upgrading Program, KENSUP (Kibera-Soweto East)

KENSUP is a nationwide program. It is implemented by the Ministry of Housing together with UN Habitat. It is being implemented in the east most part of Kibera, at a total construction cost of 2.4 billion Kenyan Shillings. The project is still in its first phase of development. The implementation of the program resulted in the relocation of the people located in the phase I area into temporary relocation areas while construction takes place. People will be relocated into their units upon completion of phase I, where they will start paying rentals of between 2000 and 3000 KShs per month (Provincial Chief Patrick, Adira, personal communication, 12 September 2012).

However, the program is being implemented without any policy guideline as the policy on upgrading is still in the pipeline. This could be a setback in the evaluation of the progress and success of the program. It is not clear how the program will address the issue of informal trading that is currently taking place, since the majority of the people in Kibera survive on informal trading. Also observed was the lack of public participation. It had to be noted that, relocation of the residents to the temporary relocation area was not well received (Provincial Chief George Onyeso, personal communication, 12 September 2012) however the government has the last say.

The success of the program is thus not assured since the residents may reject to relocate to the constructed houses; this is because earlier on, they did not pay for rent, electricity and water in the informal settlements as opposed to the new settlements. Public participation should have been a key step in the project's decision making.

2.8.3 Legislative Framework - Kenya Slum Upgrading Policy

The ministry of Housing once introduced a draft policy on slum upgrading. A symposium was held on the 14th of September 2012 to debate the proposed draft policy. The purpose of the symposium was to tackle the questions of manifestations of slums and derive appropriate policy options.

Huchzermeyer (2012) elaborated that the lack of definition in policy could lead to misinterpretations. She indicated that the policy should give clear guidelines on what is meant by upgrading.

It was further noted that slums are a failure of planning, therefore upgrading should be properly planned so as to improve livelihoods. Slums are characterized by unemployment, low wages, lack of access to credit, lack of access to basic services, health problems etc.

It was thus recommended that possible solutions that the policy should strive to address are security of tenure. Furthermore, upgrading should not see the poor as mere beneficiaries.

Instead it should encourage participation by the people so that they can take ownership of the project.

Upgrading should be tailor made, as informal settlements vary. The policy should encourage that upgrading projects use local labor, explore the use of local and recyclable building materials as well as introduce environmentally sustainable approaches so as to minimize expenditure on energy. Although the approaches might be costly however, government needs to investigate cheaper ways realizing this approach.

2.9 Limitations/ problems faced during slum upgrading

The major challenges in slum upgrading include achieving coherence in the community and finding solutions to a wide range of needs such as housing, accessibility among others.

Community hostility may cause failure of development projects. That is if there was inefficient participation of the community in decision making.

[16]Slums are not homogeneous, and there many diverse vested interests that exist in slums. In addition to the urban poor who need a decent place to live, there can be

[16] www.citiesalliance.org/about-slum-upgrading

criminal elements who take advantage of the informal space, or landlords who make small fortunes renting out shacks to people over time.

All of these interests must be properly understood and brought into the planning process. The best way to do this is through negotiated development, in which people participate in negotiating their rights and understand that all the different interests have rights that need to be brought into the equation.

Finally, poor governance may cause failure of the development projects. Mismanagement of funds among other issues may interfere with the implementation process.

[17] Slum settlements lack formal tenure arrangements. Their high densities, haphazard developments, lack of planning, poor housing, lack of infrastructure and the religious, cultural and political inclinations involved are some of the conditions that pose a challenge in proposing the type of tenure that is be best suited to the residents' situation.

Diversity in political, cultural and religious inclinations amongst the residents, and those of their leaders, have contributed in creating suspicion and mistrust amongst the residents thus slowing down decision making.

Competing interests of various groups e.g. Non-Governmental Organizations (NGOs), Community-Based Organizations (CBOs), Faith-Based Organizations (FBOs), Central Government, Local Authorities and donor agencies. These stakeholders have their own interests in the slum, most of which conflict therefore they are a major drawback to the Programme.

Lack of adequate land. There is limited land space to cater for all residents within the slum settlements and scarcity of land for re-location where necessary. Land ownership is private in most settlements. Lack of physical planning of informal settlements is a challenge towards upgrading the settlements.

Partnership concepts also have the disadvantage of generating several parallel activities that often derail the implementation schedules. There are also issues with

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[17] Government of Kenya. (1999). *Population and housing census: Analytical report on population projections,*

regard to governance and involvement of communities in decision making which have various complexities.

2.10 Role of community in slum upgrading

[18]In most societies, women and men tend to have different roles, responsibilities, needs and perceptions. As a result, slum upgrading generally affects women and men differently. Making a conscious effort to incorporate the gender dimensions of slum upgrading may most probably result in a more successful initiative.

Many women with children whose husbands have left them behind to look for work elsewhere, mostly head households in slums. In other cases, women have fled to the slums to escape domestic violence, discrimination in rural areas, or difficult situations created by divorce or marital disputes.

Community participation is a major necessity in slum upgrading, and women are at the heart of the community they are most frequently the ones who save money, look after the children, and care for the sick or elderly. The skills they have used to run households can be applied on a community-wide scale to run a savings scheme, for instance, or manage a community construction project.

The broader issue of gender, and the resulting vulnerability, is also a factor. While both men and women living in slums face hardships, women are particularly vulnerable. They are more likely to be victims of crime and violence or subject to social and cultural norms that do not give them the same legal rights or status as a man.

Moreover, women are more vulnerable to poverty because they often have limited access to land control and assets outside of marriage or within family ties. These issues must be taken into consideration when planning or implementing a slum upgrading program.

2.11 Role of the Kenyan government in slum upgrading

The Kenyan government has also tried curbing the slum development issue as well as establishing policies to aid in the same; such as vision 2030, KISIP and KENSUP.

[18] www.citiesalliance.org/about-slum-upgrading

Once the government acknowledges presence of slum growth, they plan for it and decide on policies to improve the livability of the slums

Kenya Vision 2030

Kenya Vision 2030 is the new country's development blueprint covering the period 2008 to 2030. It aims at making Kenya a newly industrializing, "middle income country providing high quality life for all its citizens by the year 2030".

The vision is based on three "pillars" namely; the economic pillar, the social pillar and the political pillar.

The economic pillar aims at providing prosperity of all Kenyans through an economic development program aimed at achieving an average Gross Domestic Product (GDP) growth rate of 10 % per annum the next 25 years.

The social pillar seeks to build "a just and cohesive society with social equity in a clean and secure environment".

The political pillar aims at realizing a democratic political system founded on issue-based politics that respects the rule of law, and protects the rights and freedoms of every individual in the Kenyan society.

The Kenya Slum Upgrading Program (KENSUP)

[19]This is a collaborative initiative that draws on the expertise of a wide variety of partners in order to redress the issue of slums. The Kenyan Government executes and manages the program while the Ministry of Housing and the relevant local authorities implement it. Civil society partners, participating local communities and the private sector complement and support their efforts. KENSUP aims to improve the livelihoods of people living and working in slums and informal settlements in the urban areas of Kenya through the provision of security of tenure and physical and social infrastructure as well as providing opportunities for housing improvement and income generation.

The main principles of KENSUP are decentralization, sustainability, democratization and empowerment, transparency and accountability, resource mobilization, secure tenure, expansion and up-scaling, partnerships and networking. With regard to the institutional set-up, there is a Settlement Executive Committee (SEC) composed of people from the community where the government is operating. SEC is the main driver

[19] https://halshs.archives-ouvertes.fr/halshs-00751869

of this program since the government wants the people to know what it is deciding. Other institutional aspects of KENSUP include the: Settlement Project Implementation Unit, Project Implementation Unit, Programme Secretariat (in the Ministry) and the Interagency Steering Committee (IASC) composed mainly of accounting officers in key relevant Ministries, Local Authorities, United Nations Human Settlements Programme (UN-HABITAT) and other development partners.

To achieve its goal and objectives, KENSUP has adopted the following strategic interventions:

Community organization and mobilization.

Shelter improvement: security of tenure or residential security, housing development and improvement.

Preparation of city/town development strategic and land use master plans.

Provision of physical infrastructure: sewerage system, water supply and sanitation, access

roads, storm water drainage, electricity and street lighting.

Provision of social infrastructure: schools, health centers, community centers and recreational facilities.

Provision of secure tenure and residential security

Environmental and solid waste management: garbage collection and treatment system,

Employment and income generation: markets, skills enhancement, micro-financing and credit systems

Addressing issues of HIV/AIDS: HIV education and awareness, counseling and testing centers, HIV dedicated clinics;

Conflict prevention and management in the targeted informal settlements and

Prevention of proliferation of slums.

Kenya Informal Settlement Improvement Project (KISIP)

The Kenya Informal Settlement Improvement Project (KISIP) is an initiative started by the Government in collaboration with the World Bank, Swedish International Development Agency (SIDA) and French Agency for Development (AFD). KISIP will focus on improving living conditions in existing informal settlements by investing in infrastructure and strengthening tenure security. It will also support the Government of Kenya (government counterpart funding is 10%) in planning for future urban growth in a manner that prevents the emergence of new slums. KISIP will be

implemented in 15 municipalities within five years from June 2011 at a cost of USD 165 million.

The project comprises four components namely:

Institutional strengthening and Programme management of the Ministry of Housing, Ministry of Lands and the participating Local Authorities.

Enhancing tenure security: This involves planning, surveying and issuance of titles.

Investing in infrastructure and service delivery. KENSUP will work on the housing whereas KISIP will deal mainly with this infrastructure.

Planning for urban growth. Lack of adequate planning is a challenge. Through this

component, the Government will provide technical assistance to the municipalities. The goal of this initiative is to take measures that will reduce or prevent slums.

2.11.1 Governance and Its Impact on Slums

Outdated institutional structures, government policies, inappropriate legal systems, incompetent national and local governance, and short-sighted urban development policies, and operational dysfunction are also a big cause of slum formation. (Share The World's Resources, 2008). At times, institutions of government leave improving the living conditions of slum dwellers to international aid agencies. The exceptions are times of political elections, where the basics of the human condition are sometimes publicly raised and debated. There are many examples where public officials and politicians treat slum dwellers for political reasons, which only worsen and extend the problem (Shackelford & Davis, 2003). Understandably, a common consensus that seems to emerge from many initiatives and authors is that slums cannot be exempted in any form, or under any conditions since their rapid expansion means that society has no effective control over them, thereby projecting a miserable image of the human future.

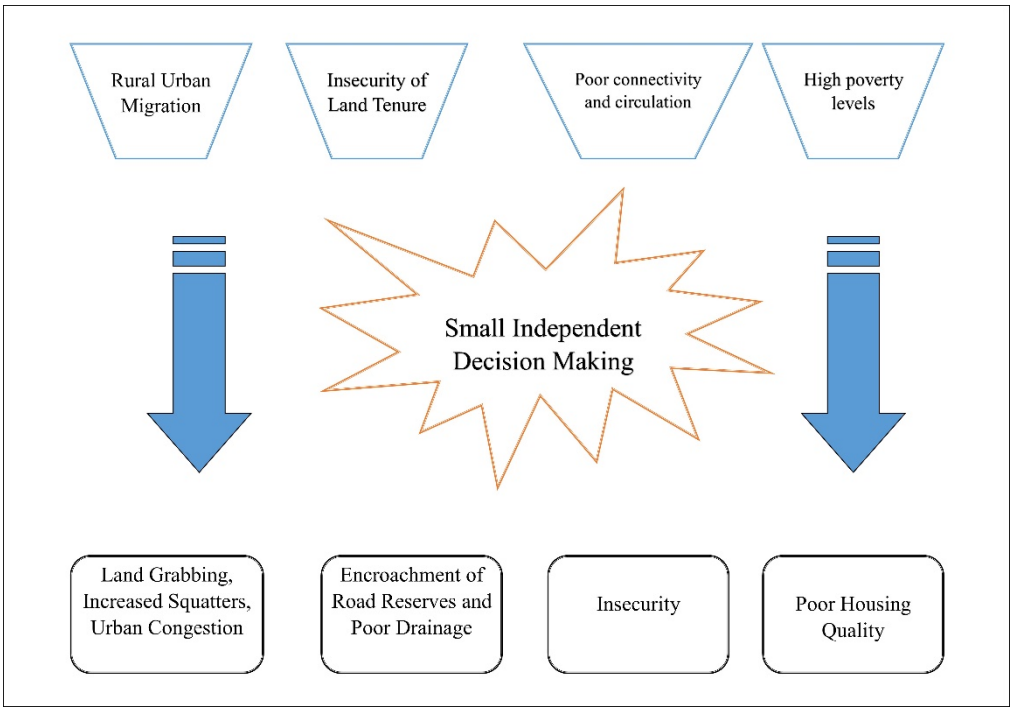
2.12 Theoretical Framework

This study is guided by 'The Tyranny of small decisions' theory *(Alfred E. Kahn, 1966),* which describe a situation whereby numerous small decisions cumulatively contribute to undesirable outcomes. Residents' decisions in slum areas for instance construction of temporary habitats and poor waste management result in a major

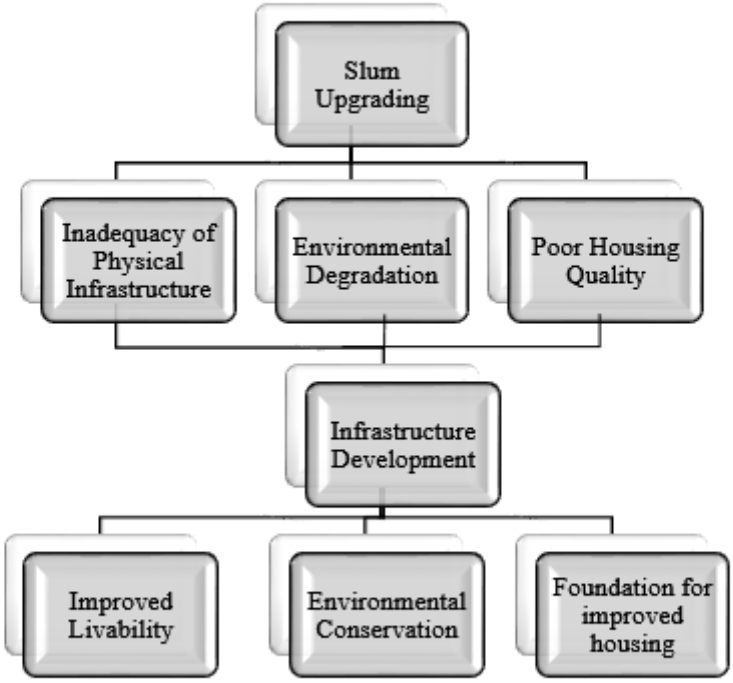
tragedy of overexploitation of available resources as well as environmental degradation generally.

The study goals may be achieved through the 'Common Property protocols of management' strategy. The management protocols enable the maintenance of resources, since the various users act independently thus threatening the cumulative benefit from the common pool resource.

Elinor Ostrom identified eight principles to guide the protocols which included participation of the users as well as monitoring and provision of laws and regulations governing the same.



2.13 Conceptual Framework



2.14 Research hypothesis

2.14.1 Alternative hypothesis

Provision of Infrastructure and services can facilitate slum upgrading and development.

2.14.2 Null hypothesis

Provision of Infrastructure and services cannot facilitate slum upgrading and development.

2.15 Statistical assumption

The information offered during data collection through sampling is uniform to the entire area since it could not be possible for all residents to participate.

3 CHAPTER THREE; RESEARCH METHODOLOGY

3.1 Research approach

The study was done in a descriptive approach carried out through data collection. A qualitative approach was mainly applied so as to gather the opinions and perceptions of the residents on the relevant issues of research

A quantitative approach was also used to support the data collection, though minimally since little statistical data is available on the area of study.

3.2 Research design

The study entailed a descriptive research seeking to ascertain some of the causes of slum growth and development, the physical appearance of slums and the problems faced by the urban poor inhabiting the slum areas; Case of Majengo slum in Mtwapa township in Kilifi county.

3.3 Research situs

The research was carried out for Majengo slum in Mtwapa Town, Kilifi county. Recommendations at the end of the research may be used to impact positive change to other slums facing similar issues.

3.4 Research methods

The study research employed documentation review of relevant publications on the area of study on the topics affecting the study, review of archival questionnaires conducted generally in the area of study and other areas in Kilifi county.

3.4.1 Documentation review

Various documents including text books, reports, published works and websites were reviewed to provide the necessary information on the study. However, there being minimal documentations on the site of study, some information on the site was inaccessible. Nevertheless, the methods used were suitable to acquire useful information.

3.4.2 Questionnaires

Household open-ended questionnaires administered during the Kilifi county spatial plan preparation provided some insights on the general state of informal settlements

and urban slums in the county. This information was used correlatively with the documentation review to provide the data necessary to perform this study.

3.5 Data collection techniques

3.5.1 Primary data

This was obtained from household questionnaires conducted earlier on in the county during the preparation of the Kilifi County Spatial plan.

3.5.2 Secondary data

This data entailed review of published reports, scholarly journals, internet, books, newspapers and government agencies' documents relating to the topic of research on the site of study.

3.6 Sampling

It entailed acquiring information of an entire population by observing a fraction of the population.

Purposive sampling was done during the open-ended questionnaire administration in strategic parts of the county, including informal settlements. Most of the informal settlements and slums undergo similar issues, thus information from any of the informal settlements was relevant to the area of study.

Information relating to slum areas and informal settlements was singled out to enable easier data analysis.

3.6.1 Population and sample size

The target population to be sampled was that of the study area inhabitants and the physical characteristics of the area.

3.6.2 Sampling unit

Sample unit results were recorded as numbers, proportions or percentages.

3.6.3 Sample frame

It entails all those within a population that can be sampled. They may include individuals, households and institutions. Probability sampling may thus be used wherein the samples gathered gives all the individuals in the population equal chances of being selected.

3.6.4 Sampling method

3.6.4.1 Simple Random Sampling

This involved picking of random individuals for interviews from different parts of the area of study.

3.6.4.2 Stratified Random Sampling

This was used in sampling the various residents on site into sub-groups; individuals, households and institutions.

3.6.5 Subjects

These are the individual residents, local authorities and organizations in the area. They shall give their insights on the current conditions and their desired developments.

3.7 Data analysis

Raw data collected from all sources and the case studies was organized to inform on the synthesis and interpretation.

3.8 Data presentation

Drawings and maps, sketches prepared by the researcher and photographs shall be used to elaborate on the research findings.

3.9 Research ethics

This can be defined as the ethics of planning, conduct and research reporting. They include honesty, objectivity, confidentiality, respect for intellectual property, openness, responsible publication, human subjects' protection and non-discrimination.

4 CHAPTER FOUR; STUDY AREA AND CASE STUDIES

4.1 Introduction

This chapter seeks to explain the history, development and background, the population and settlement and physiographic and natural features of the study area. Relevant case studies will also be featured in the chapter.

4.2 History and Background

Mtwapa town, located in Kilifi county, is one of the fastest growing towns in Kenya, also boasting of a 24-hour economy. However, due to lack of proper spatial planning, it is dotted by numerous informal settlements. Most of these settlements experience land tenure problems, since they are either located on government or privately owned land, among other issues like scarcity of infrastructure, insecurity and waste management.

Majengo settlement lies at the northern end part of Mtwapa town along Mombasa-Malindi highway, B8. When compared to other slums in the vicinity, it bears the lowest proportion of permanent dwellings, as well as the highest proportion of temporary dwellings (made of mud walls and tin roofs or *makuti* - palm leaves.). It also has close to the highest number of slum inhabitants with the lowest average monthly income per household.

Makweza swamp, which lies close to the settlement poses a flooding problem to the residents during rainy seasons.

4.3 Relevance of the site to the study.

This study aims to outline the role of infrastructure in urban slum transformation by using Majengo slum as a case study. Just like other slums in the country, it is faced by problems such as circulation and accessibility, insecurity, lack of security of tenure, inefficient drainage amongst others. The outcomes of the recommended developments should expound on the positive effects infrastructure development can impact on informal settlements.

4.4 Population and Settlement

The population of Majengo slum stood at approximately 7788 people as per the 2009 National census with the approximated number of dwellings at 1800.

Population growth is mainly influenced the birth rates, rural-urban migration, change of agricultural use to commercial and residential and boundary extensions. Majengo mainly serves as a residential area for workers of the industries around as well as the agricultural areas.

4.5 Case studies

4.5.1 Local case study

4.5.1.1 Solid waste management in Shella, Malindi

The Malindi green town movement was formed to introduce sustainable integrated environmental management in urban development in order to achieve a healthy and clean environment of the Malindi area. It mainly targets the urban poor residents.

In Shella, it entailed formation of youth groups that collect solid waste in the area to a recycling center that features a cottage industry and a biodegradable material collection point that is converted to manure for agricultural use. The cottage industry provided employment for some youth and women through recycling of some of the waste into income generating items like baskets and bags.

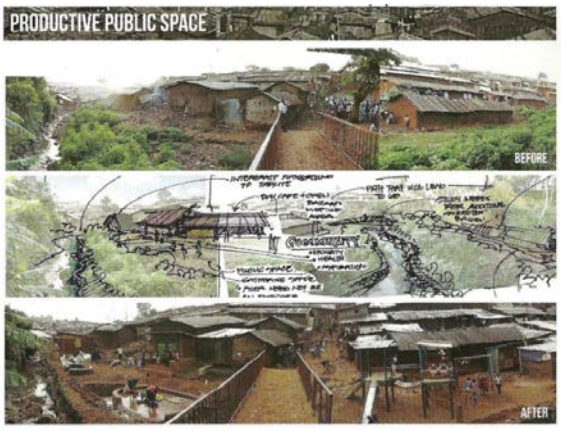
Dumping in Shella before the waste management project.

Present day clean Shella after establishment of the waste management project

4.5.1.2 Slum upgrading initiatives in Kibera –Kounkuey design initiative

It is a partnership specializing in practice of architecture, landscape architecture, engineering and urban areas where environmental degradation compromises quality of life. It brings together diverse participants such as residents, local design students, private sector experts and government officials, to implement context appropriate

design interventions that improve the physical, social and economic health of a community.



Dumpsite in Kibera before and after development into a Community Centre

Lessons Learnt

Community participation, that entailed formation of community development groups, was a key strategy in providing workable solutions such as improvement of sanitation and introduction of a sewer system.

An innovative human waste management system that forms *humanure* compost which can later be used as agricultural fertilizer.

4.5.2 Global case study

4.5.2.1 Yerwada Settlement in India

Background of the project

This program was under the Basic Services for the urban poor (BSUP) component of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM)

The project involved infrastructure and standard housing improvement in Yerwada slum in Pune, India.

Dumping and settlement condition in Yerwada slum before upgrading

Community participation workshop

Model building design before implementation.

A Street in Yerwada before and after upgrading.

Lessons learnt

Main development strategies involved; In-situ slum upgrading, Community participation and workshops, Retaining and improving resilience of the slum to create a sense of belonging to residents, Vertical development, standardized self-contained multi-level building, use local labor to provide employment.

Limitations

It was hard for some of the residents to raise the income to pay for the expenses of providing the services, due to lack of efficient income earning opportunities and high poverty levels.

Local governments implementing the BSUP– funded developments lack of organizational capacity and tools to effectively engage in inclusive governance.

4.6 Legal and Institutional framework

Urban congestion is a major problem in numerous developed and developing countries, therefore several legislations and international conventions to promote sustainable slum transformation have been established. Most of them have revolved around Public housing, (demolition of slums and replacement with tenement public housing), forceful eviction, site and service schemes and slum upgrading. Some of the successful policies facilitated economic development and improved livability of the slums. According to UN Habitat, 2003, participatory slum upgrading has lately been the most successful by creating wholistic development transformations and creating a sense of ownership of the developments to the residents.

Various upgrading measures to improve the conditions in informal settlements and slums through various legislations and policies have already been established.

4.6.1 Millennium development goals

[20]Goal 7 target 11 of the technical indicators aims to have achieved a significant improvement in the lives of at least 100 million slum dwellers by the year 2020.

4.6.2 The Kenyan Constitution

Chapter 4, section 43 (1) on Economic and social rights emphasizes on the right of every person to access basic healthcare and reasonable sanitation standards, accessible and adequate housing as well as clean and adequate quantities of water.

4.6.3 The Poverty Reduction Strategy Paper, 2005.

It outlines that among the poverty targeted programs, the living conditions of millions of the urban poor in major cities and access to basic water and sanitation, roads, housing and energy infrastructure will be improved, through relocation plans that involve land adjudication and registration amongst other projects to enable provision of the inadequate infrastructure.

4.6.4 Kenya Vision 2030

The vision's objective of the social pillar includes building a [21]just and cohesive society with social equity in a clean and secure environment targeting a cross-section of human and social welfare projects and programmes such as environment, water and sanitation, urbanization and housing.

4.6.5 The National Slum Upgrading and Prevention Policy(NSUPP), 2012

The policy focuses on 7 thematic areas: Legal Framework Governance and Institutional, Infrastructure and Services, Housing and Shelter, Planning, Development Control and Environment, Land Tenure and Administration, Socio Economic Factors, Safety and Security.

The taskforce also considers other essential elements of slum upgrading that include; linking the formal sector, sustainable slum financing and budgeting, clear governance and institutional structure, stakeholder and community participation, clear implementation framework and practicality, flexibility, clear statement of slum causes, definition of slum upgrading and slum prevention.

[20] http://www.unmillenniumproject.org/goals
[21] www.vision2030.go.ke

4.6.6 National Housing Policy, 2004

It entails how upgrading of slum areas and informal settlements is to be undertaken with minimal displacement to facilitate effective planning and provision of infrastructure and related services. Relevant upgrading measures to be instituted for existing slum areas taking into consideration key upgrading components that cover land tenure security, provision of basic infrastructural facilities and services, improvement of housing structure and the socio-economic status of the target community.

4.6.7 Participatory Slum Upgrading Programme (PSUP), 2008

This was a joint effort of the African, Caribbean and Pacific (ACP) Group of States, the European Commission (EC) and UN-Habitat.

The program was geared towards focusing on the strategy development, [22]aiming to improve the institutional coordination and responsibilities as well as identifying the roles of key ministries, NGOs, the private sector and donors in slum upgrading.

The policy clearly expresses on the need for a slum upgrading Policy. It recommends the development of a Slum and Resettlement Programme and the essence of measures to prevent further slum development.

In reference to the International and regional perspective, Kenya is signatory various declarations and treaties acknowledging the right to adequate and improved housing whose realization cannot be attained without addressing the issue of slums. These treaties include *Universal Declaration on Human Rights (UDHR), Convention on the Rights of the Child (CRC)* and *the African Charter on Human and Peoples Rights (ACHPR), the International Covenant on Economic, Social and Cultural Rights (ICESCR), the Vancouver Declaration on Human Settlement.*

[22] http://unhabitat.org/urban-initiatives/initiatives-programmes/participatory-slum-upgrading/

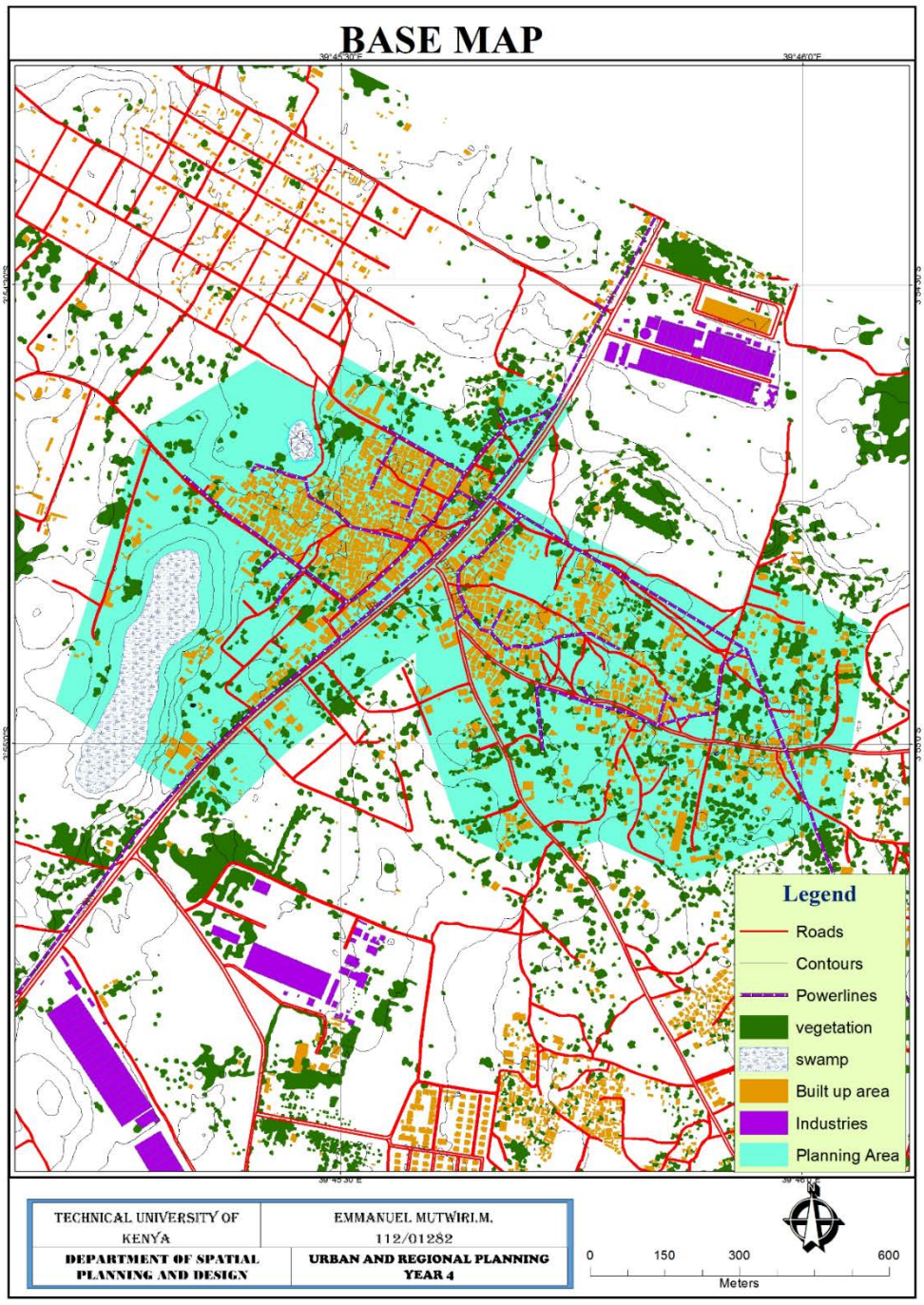
5 DATA ANALYSIS AND DISCUSSION

5.1 INTRODUCTION

The physiographic conditions and characteristics of the area of study were analyzed into diverse categories, this influenced the decision making process after data synthesis to determine the development strengths, weaknesses, potentials and threats of the area of study.

5.2 Base Map

It consists of major physical situational characteristics of the site such as topography, circulation and accessibility and ground cover.

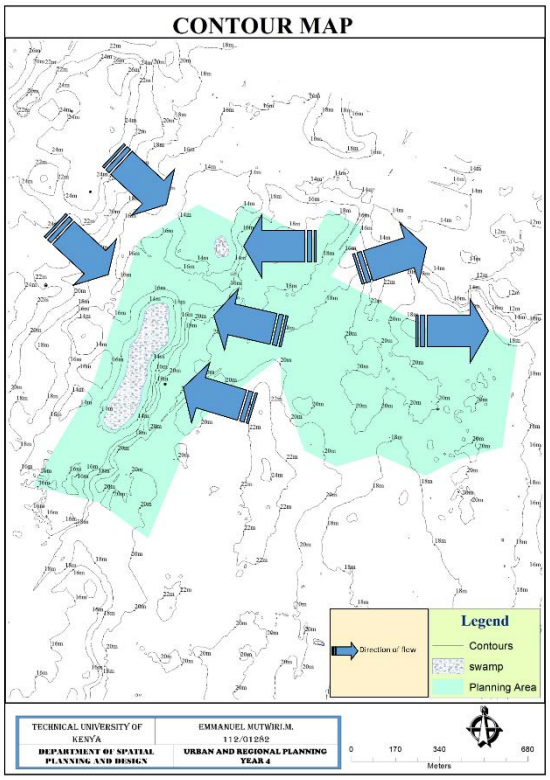


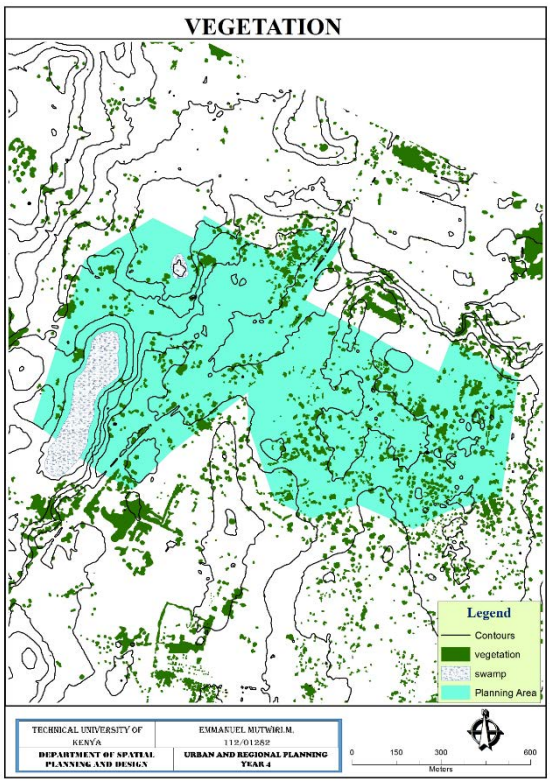
5.3 Topography

This is characterized by slope analysis which entails documentation of the altitude, vegetation cover and the run-off water direction of flow.

The area lies study between 24 metres and 14 metres of altitude. The low altitude areas below 16 metres are prone to flooding during the rainy seasons due to the presence of swamps around the area.

Surface run off on site thus flows towards the swamps due to the slope of the area.





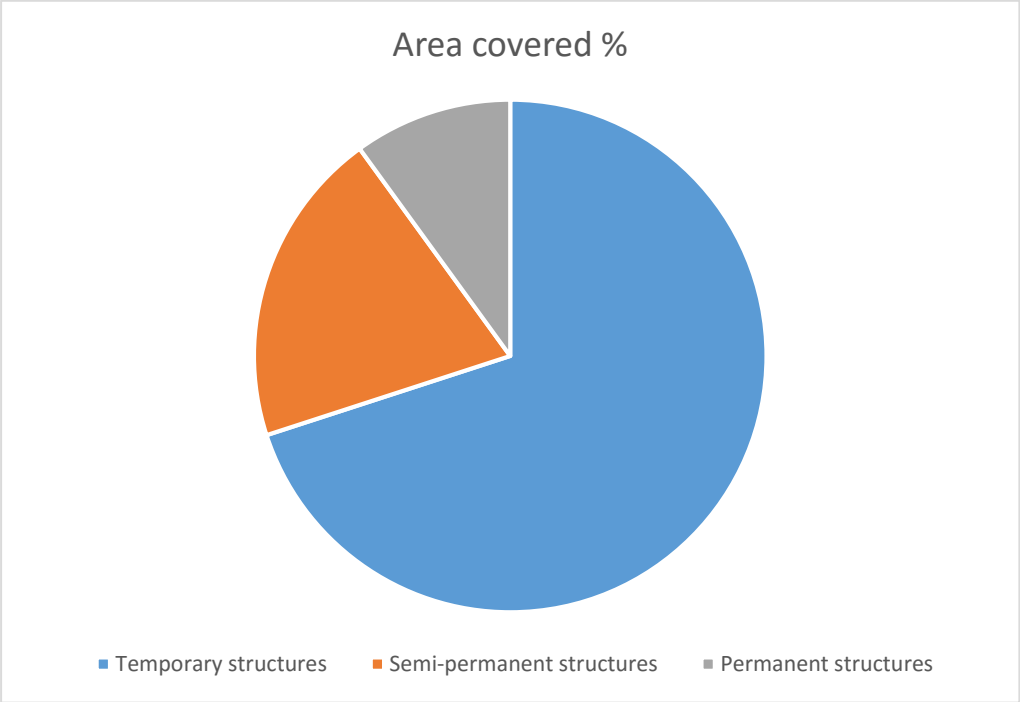
Makweza swamp in Majengo

Settlements in low attitude areas affected by flooding

5.4 Settlement

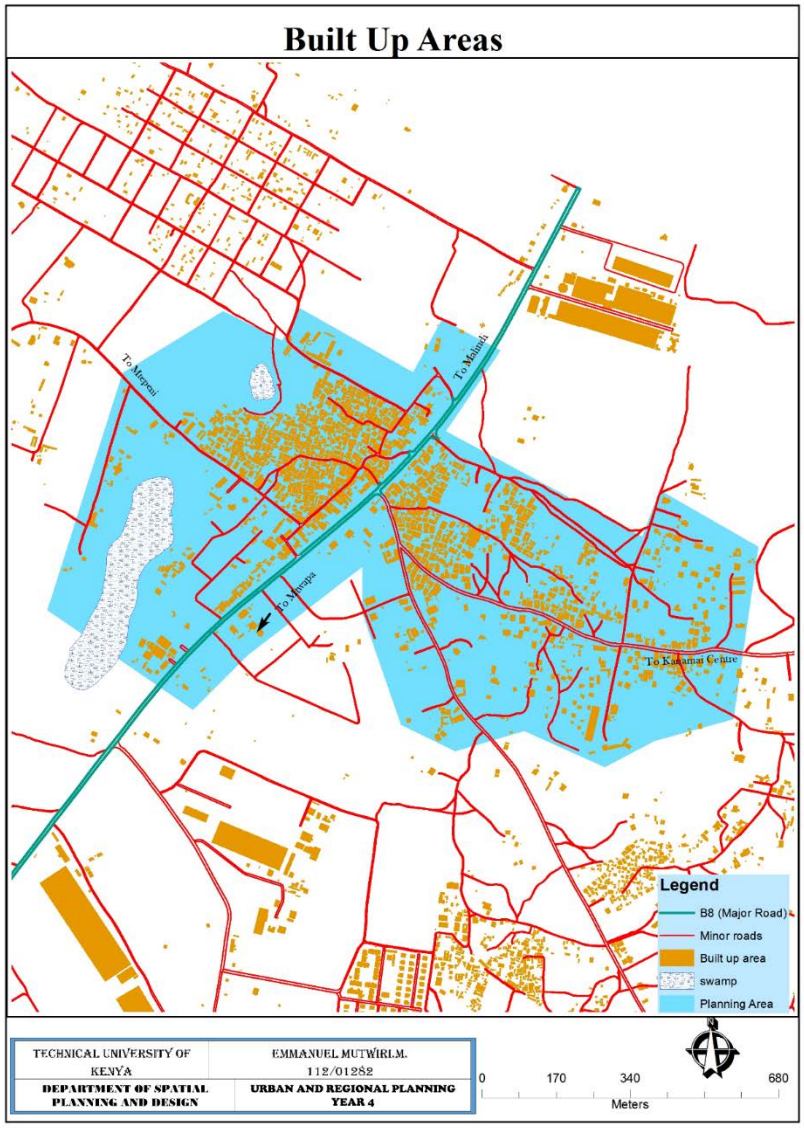
The settlement trend can be termed as linear since it originates from the B8 highway outwards spreading outwards into the hinterland. New settlements are also scattered along the Majengo- Kanamai road (Dry weather road).

[23]An estimated 70% of the total settlements in Majengo are temporary structures, while semi-permanent at 20 % and permanent structures at 10%.



The poor state of buildings around the slum.

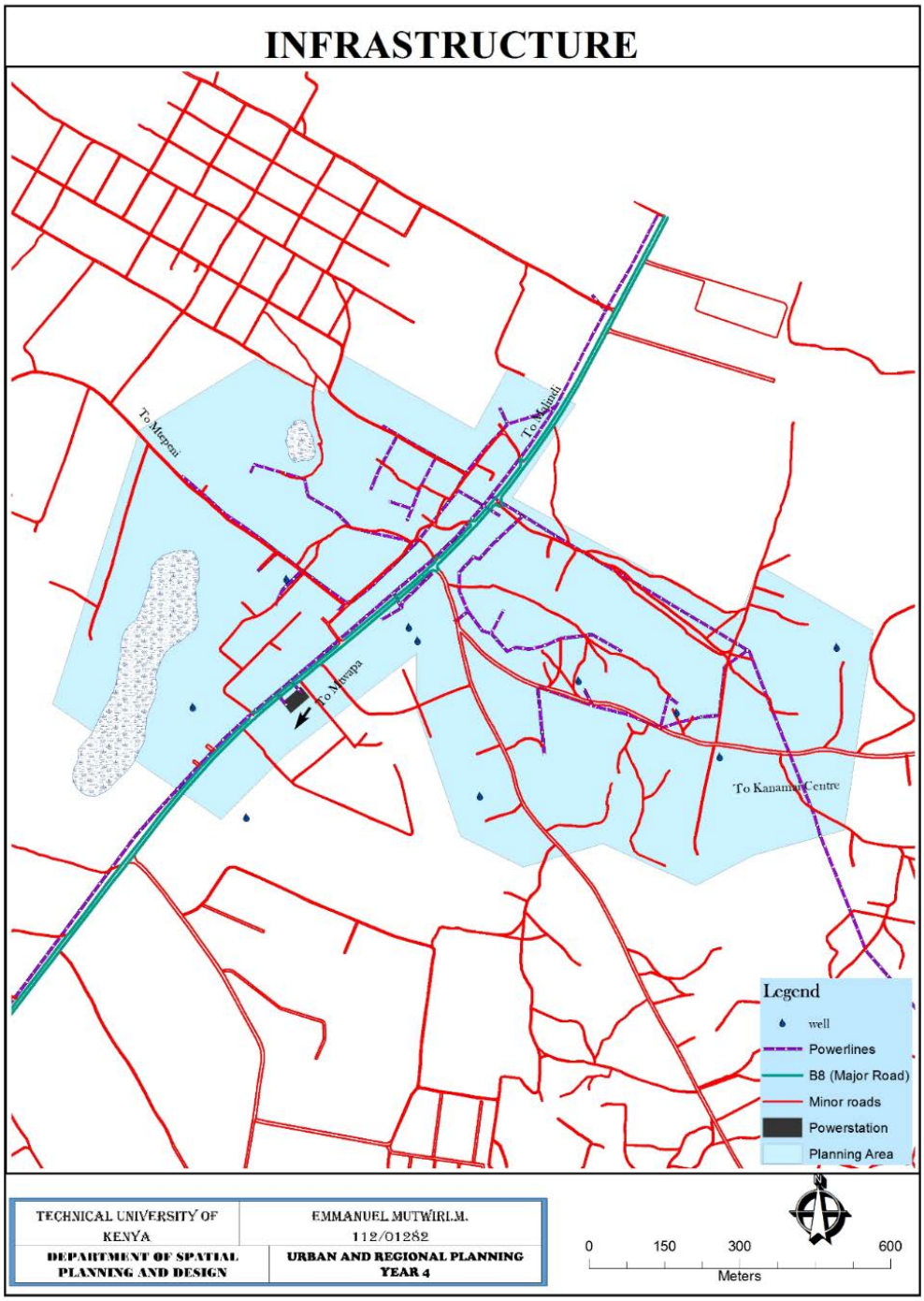
[23] Mtwapa Integrated Strategic Urban Development Plan



5.5 Infrastructure

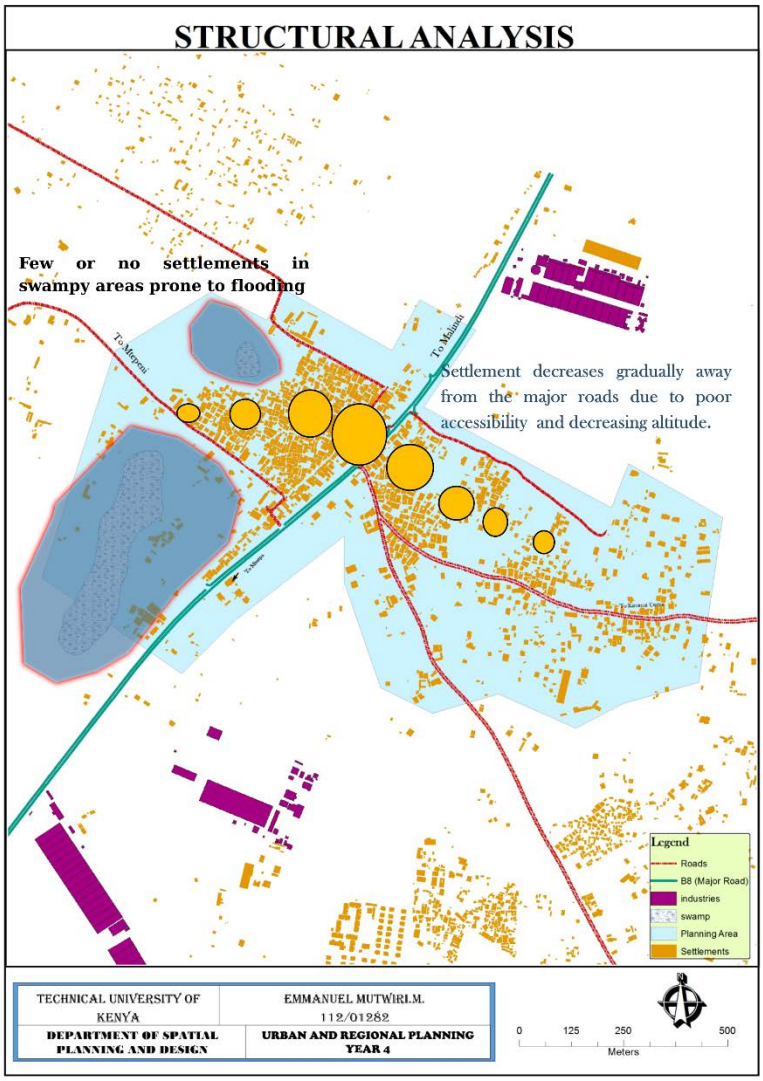
Inadequacy of infrastructure is a major development shortcoming in Majengo, as well as other slums and informal settlements in Mtwapa and Kenya at large. It is characterized by lack of street lighting, sewage and drainage systems, poor accessibility and circulation as well as inadequate electricity.

The existing infrastructure is faced with vandalism due to high rate of insecurity as well as the strain to support the ever-growing population.



Poor accessibility and lack of drainage systems

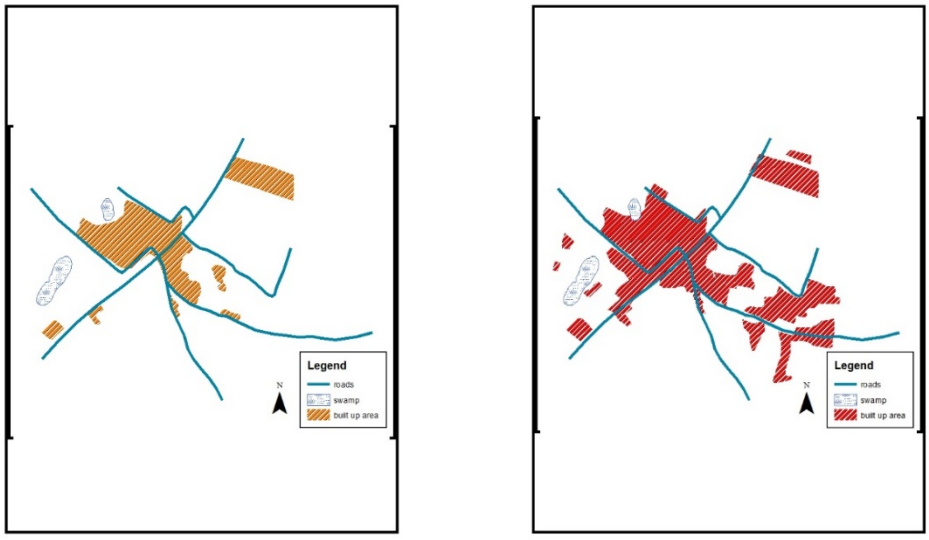
5.6 Discussion and synthesis.



The planning elements on site include the swamps, B8 highway and other minor- class E roads.

The settlement trend originates from B8 highway and mostly to the east than west. This is due to the flooding of the swamps and the low altitude of the western part.

The lack of adequate infrastructure and space organization to the east causes a rather scattered and unplanned settlement trend despite the favorable altitude.



Settlement trends showing the sprawling development; the presence of flooding on the western side causes a shift in settlement eastwards towards Kanamai Centre.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 RECOMMENDATIONS

Recommended design and planning strategies are guided by the Concept of using infrastructure as 'The Urban Catalyst'.

Principles

The new element modifies the elements around it and transforms the existing.

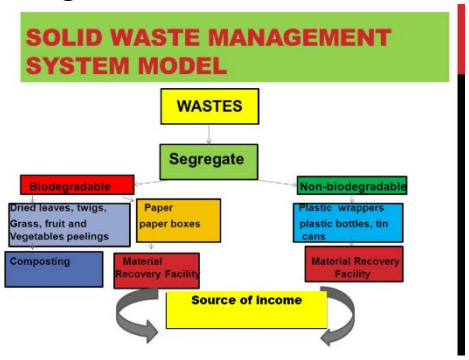
A positive catalyst design is strategic resulting in better products than the sum of the ingredients.

Each catalyst reaction is distinct

In reference to the above model, the main development approach will be inclusive approach featuring community participation and the willingness for change by the residents.

6.2 Proposed infrastructure

6.2.1 Solid waste management



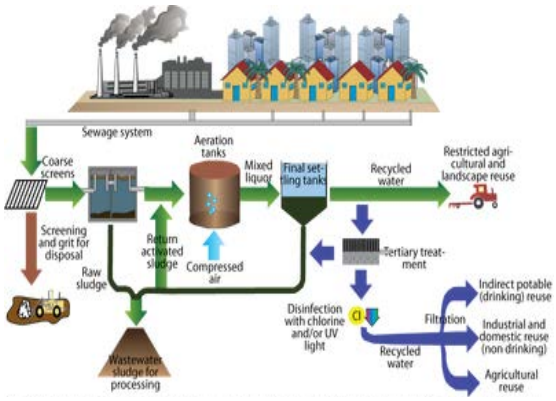
This model is informed by the case study of The Malindi Green Town Movement strategy of solid waste management. A recycling plant featuring a textile industry will empower the residents, by providing a source of income for both the waste collectors, skilled and semi-skilled industrial labor for making textile products. These products can be sold to the tourists in Mtwapa town as well as other major towns across the country.

Further growth in the textile industry can play a major role in solid waste management in the larger coastal region, as well as promoting economic development, environmental protection and increased employment opportunities.

6.2.2 Line infrastructure

This shall involve;

Introduction and improvement of electricity supply lines, Waterlines linking the existing structure to the sewage treatment plant to increase water supply, Sewage system and sewage treatment plant,

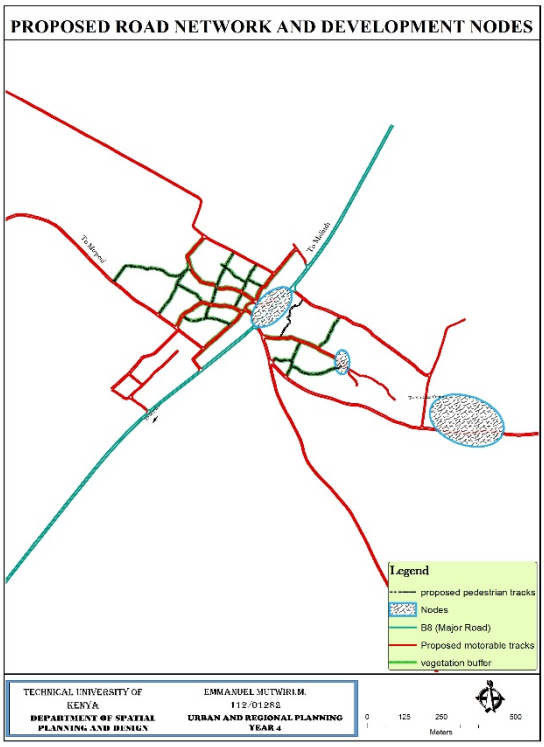


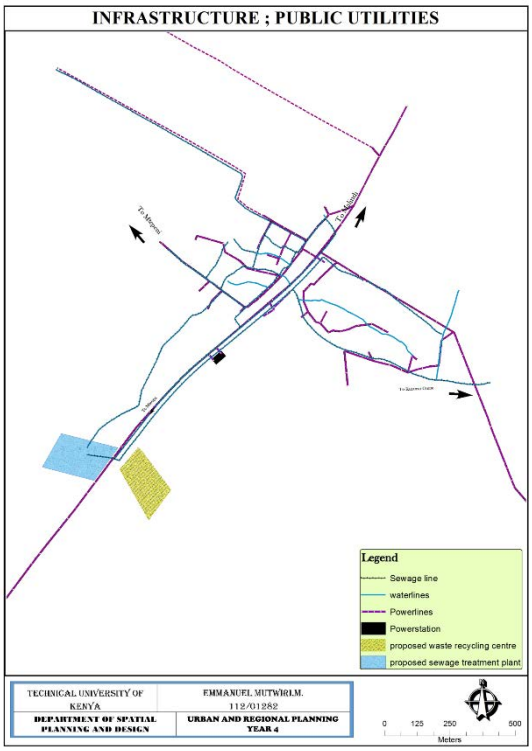
Conceptual diagram illustrating a modern central collection and wastewater treatment plant to provide recycled water for agricultural and domestic uses.

A sewage treatment plant and a solid waste recycling center, both featuring the regulated buffers, are proposed to the southwest of Majengo town. The sewage treatment plant shall improve the supply of clean water in the area as well provide manure for agricultural activities.

Improvement of existing motorable roads and introduction of pedestrian walkways to improve accessibility. These shall also feature linear vegetation along the roads to improve the microclimate of the area.

Trees help improve the environment by highly supporting the ecology and balancing the ecosystem.



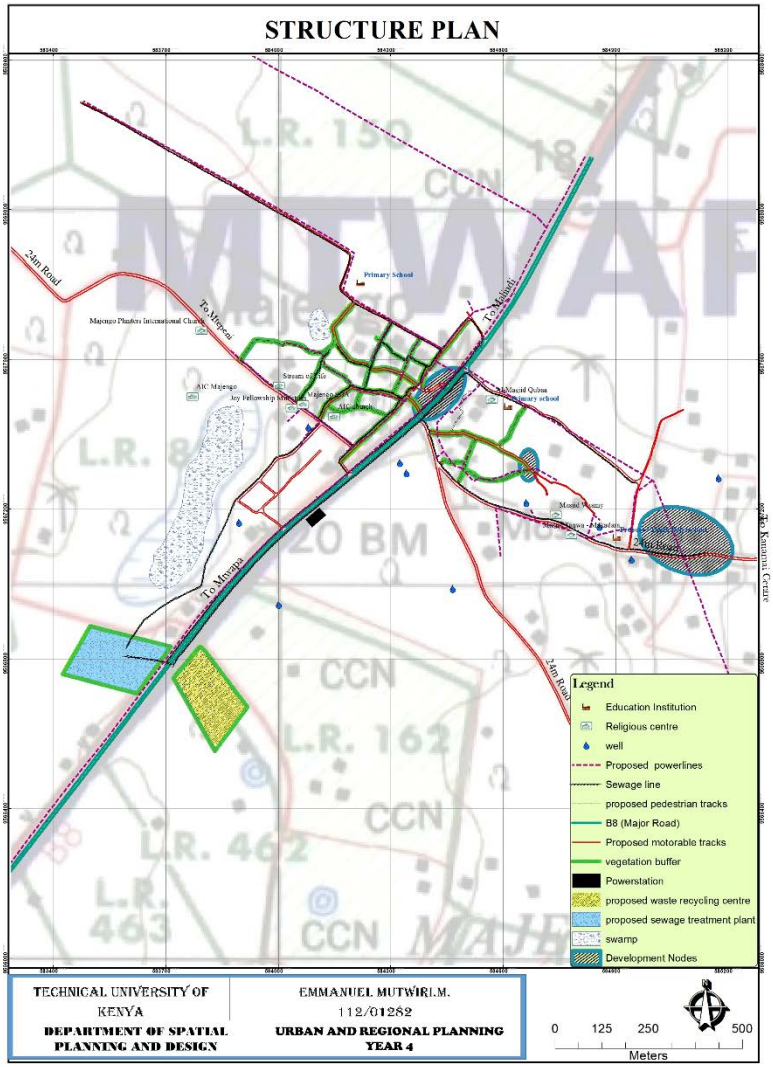


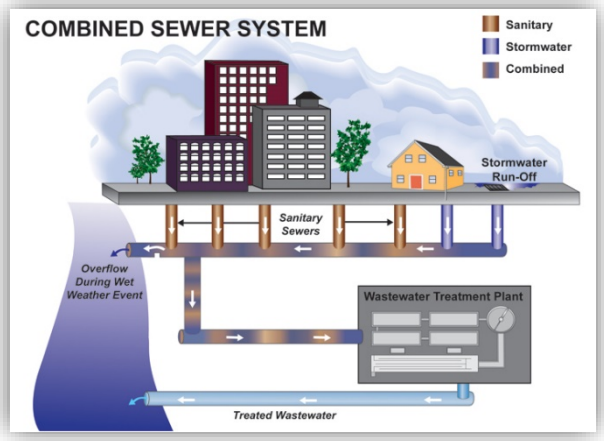
Development nodes are proposed at three different potential areas. These shall act as central points for activities such as administration, religious centers, markets and cultural centers. Urban growth is thus projected to arise from these nodes spreading outwards into the rural areas.

6.3 Proposed plans

6.3.1 Proposed structure plan

It helps elaborate the network of the proposed infrastructure and the recommended development nodes as well as public facilities like education and religious centers.

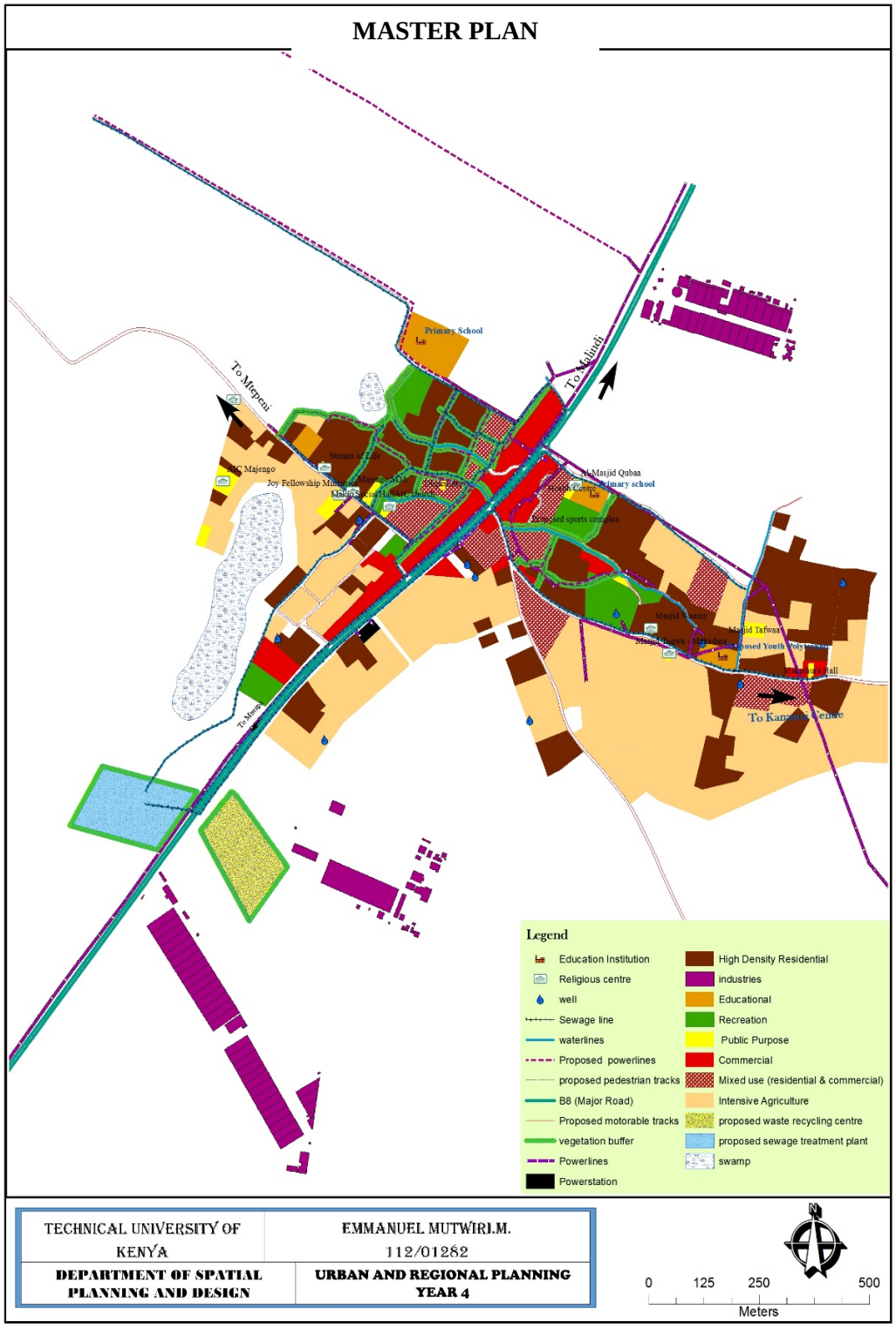




A conceptual plan of a combined sewer system integrating storm water run-off and sanitary sewage.

6.3.2 Proposed Master Plan

This shows the projected land use as part of the effects infrastructure development might impact on the area of study.



The *residential zone* shall mainly consist of high density dwelling units since majority of the residents are low income earners. The units shall have adequate access to infrastructure such as electricity, water, circulation and waste management services.

Mixed use zones shall consist of both commercial, residential and recreation activities. These zones shall enable maximum sustainable use of space and reduction of travelling time.

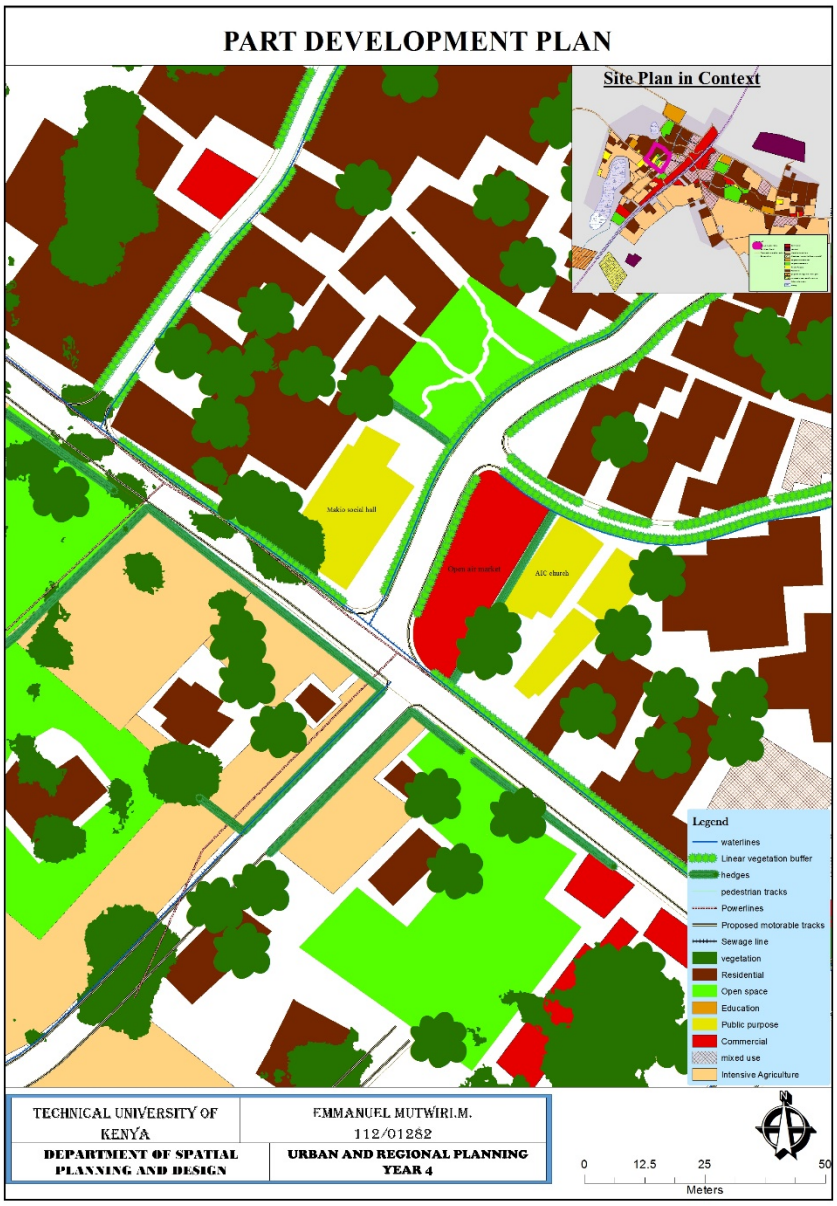
Commercial zone shall entail shopping centers, entertainment joints and strategic markets.

Recreation spaces shall include urban parks, a stadium/sports center and small parks in the residential zones.

Intensive agriculture areas shall ensure increased food productivity by embracing modern farming practices such as greenhouse methods, and use of *humanure* generated from the waste treatment plant. Kenya Agricultural Research Institute in the vicinity of Majengo town may provide information on the suitable agricultural practices to be embraced.

6.3.3 Part development plan

This presents the projected plan of a section of the area after infrastructure development.



Example of the proposed combined line infrastructure tunnel; includes sewer line, electricity lines, fibre optic cables and water lines

6.4 AREAS OF FURTHER RESEARCH

The recommended areas of further research include the improvement of the housing quality as well as provision of other suitable public facilities that can support further sustainable development.

Establishment of development nodes at strategic points to act as central places for access to public facilities.

7 IMPLIMENTATION MATRIX

Planning Issue	Objective	Activities	Actors	Timeline		
				Long	Medium	Short
Poor circulation and Connectivity in the area.	To improve accessibility and traffic circulation in the settlement.	-Upgrading of roads connecting Majengo to other urban areas such as Kanamai and Mtepeni, as well as roads inside the settlement.	Ministry of Roads Department of Transport and Infrastructure– Kilifi County		■	
		-Introduction of pedestrianized streets in the residential zones.				■
Lack of basic infrastructure	-To Provide for basic infrastructure such as electricity, conventional sewage system and clean water.	-Introduction of a sewer line and a sewage treatment plant to increase water supply, and waterline network to distribute the treated water.	Department of Transport and Infrastructure– Kilifi County	■		
		-Construction of an underground tunnel to hold trunk infrastructure such as sewer lines and waterlines.		■		
		-Addition of powerlines in the settlement areas without electricity.				■

Low of food supply	-To Improve agricultural yields. -To improve livelihood of the rural population which depend largely on agriculture	-Introduction of intensive agriculture under the guidance of Kenya Agricultural Research Institute in Mtwapa.	-Department of Agriculture, Livestock and Fisheries- Kilifi County -Department of Trade, Industrialization , Cooperatives Development- Kilifi County			
		-Use of manure from the waste recycling center and humanure from the sewage treatment plant.				
Dumping of solid waste in open spaces.	Introduction of a waste recycling Centre.	-Formation of a cottage industry for plastic waste recycling.	Department of environmental management, Kilifi county.			
		-Biodegradable waste recycling section to produce manure for agricultural use.				
Scarcity of vegetation. .	To increase vegetation to improve the microclimate as well as environmental conservation.	Planting of linear vegetation along the roads and pedestrian walkways.	Department of environmental management, Kilifi county			

8 PROPOSED POLICY ACTION AND JUSTIFICATION

ACTION	STANDARD	POLICY
♦ Urban developments ♦ Waste disposal system ♦ Natural conservation ♦ Electrical infrastructure projects	Preparation of Environmental Impact Assessment Report	♦ Environmental Management and Coordination Act , 2013
♦ Sewage collection and treatment plant.	Required for population exceeding 3000 people.	♦ Physical planning Handbook , 2007
♦ Tree belt for sewage treatment plants	75 square metres buffer	♦ Physical planning Handbook , 2007
♦ Minor roads ; class E	20-25 metres width	♦ Physical planning Handbook , 2007

9 Appendix: Household Questionnaire

The Technical University of Kenya

Department of Urban and Regional Planning

I am a Student pursuing a Bachelors' degree in Urban and Regional Planning at The Technical University of Kenya. I am undertaking a study as a requirement for the completion of this degree entitled: The Role of Infrastructure in Urban Slum Transformation, A Case study of Majengo informal settlement, Kilifi County. Public participation is one of my main strategies towards achieving my objectives. I therefore humbly seek your participation in filling this questionnaire.

Declaration: The information and data provided will be confidential and is intended for academic purposes only

Please answer these questions to the best of your knowledge.

Name of the Interviewer ----------

Date of interview ----------

A. Household information

1. (a) What are your household characteristics? (Please fill in the table below)

Member/s	Gender	age	Education level	Main occupation	Income from main occupation (p.m.)	Other sources of income	Income from other sources (p.m.)

2(a)Place of Birth…….

(b) If not Majengo, reason(s) for migrating to this place? .....

(c) For how long have you been living here?

(i) 1-5yrs [ ] (ii) 6-10yrs [ ] (iii) 11-15yrs [ ] (iv) 15yrs and above [ ]

4. In your opinion, has the physical extent/size of the existing Majengo slum increased or decreased over time?

(i) Increased [ ] (ii) Decreased [ ]

5. What is the type of housing that you use?

(i) Tenant purchase housing [ ] (ii) Built by owner [ ] (iii) Cash purchase [ ]

(iv) Any other (Specify)……

5. What is the type of roofing in your house ……

6. What document shows ownership of the land you reside in? ……

7. Where do you get water for;

domestic use…….

Agricultural use……

(i) To the scale of 1 to 10, how would you rate;

The water quality and safety from the source above……

The availability of water from the above source…….

The distance travelled to the water source…….

8. What source of energy do you use for;

Lighting……

Cooking …….

9. How do you dispose human waste …….

10. Indicate the current situation on urban services provision of water and sanitation?

	Good	Moderate	Satisfactory	Poor
Water supply				
Sanitation facilities				

14. Indicate the state of infrastructure, open spaces, morbidity/circulation, street lighting and emergency services in Majengo?

	Good	Moderate	Satisfactory	Poor
Infrastructure				
Open spaces				
Morbidity/Circulation				
Street lighting				
Emergency services				

15. Are you content with the security measures provided by the government?

Yes/ No. If no, why?……

What do you think can be done to reduce insecurity?.....

16. Was there community participation in earlier government projects in Majengo?

……

19. Do you think provision of basic infrastructure will improve the livability and economy of Majengo?

…….

20. What is your preferred slum intervention approach to improving the livelihoods of the Majengo community?

……

21. At what level would you like to be involved in any slum rehabilitation project?

(i) Planning phase [ ] (ii) Design phase [ ] (iii) Construction/implementation phase [ ] (iv) Monitoring and Evaluation [ ]

THANK YOU FOR YOUR COOPERATION

10 REFERENCES

What is urban upgrading? -MIT [accessed 13th Oct 2015]

Define Infrastructure at Dictionary.com

Sullivan, Arthur; Steven M. Sheffrin (2003). Economics: Principles in action.

Claudio TORRES , Fabienne PERUCCA and Joshua MULANDI *UN-Habitat, United Nations Human Settlements Programme*

UN-Habitat. (2004). The State of the World's Cities Report: *The Millennium Development Goals and Urban Sustainability*

World Bank, (2001). 'Upgrading Urban Communities a Resource for Practitioners'. http://web.mit.edu/urbanupgrading/index.html

World Bank. (2002). Lessons on Urban Upgrading. Urban Notes: *Upgrading Experiences from Developing Countries.*

Bhaan, G. (2012). Urban Social Security in India. *21st Century Indian City: Developing an Agenda for Urbanization in India*, Berkely, 2012.

UN-Habitat. (2003). *The challenge of slums: Global report on human settlements 2003.* London: Earthscan Publications.

Roy, A. (2011). The blockade of the world-class city: Dialectic images of Indian urbanism. In A. Roy, & A. Ong (Eds.), *Worlding Cities: Asian Experiments and the Art of being Global* (pp. 259-278). Mal-den, MA: Wiley & Blackwell. http://dx.doi.org/10.1002/9781444346800.ch10

Burra, S. (2005). Towards a Pro-poor framework for Slum Upgrading in Mumbai, India. *Environment and Urbanization*,

Cities Alliance: Cities without Slums (2011). *2011 Annual Report: A Strengthened Partnership for Inclusive Cities.* Cities Alliance.

Cities Alliance (1999). *Cities without Slums.* Cities Alliance.

Forester, J. (1999). '*The Deliberative Practitioner: Encouraging Participatory Planning Processes'*. The MIT Press. London.

Abbot, J. (2002). An analysis of informal settlement upgrading and critique of existing methodological approaches.

Devas, N., Amis, P., Beall, J., Grant, U., Mitlin, D., Nunan, F., et al. (2004). Urban Governance, Voice and Poverty in the Developing World. London, UK: Earthscan Publications Ltd.