Land Transformation and Criminal Violence in Dandora Neighbourhood, Nairobi, Kenya

Romanus O. Opiyo

Violence and the fear of violence is gaining currency as one of the major threats of sustainable urban life in Kenya that not only affects the economic and social milieu but also limits people in their choice of space and time for all activities. This paper originates from a study carried out in Kenya's capital city, Nairobi, and is concerned with understanding how land use and its changes ultimately influence crime prevention. The research for this work was part of a wider study[1] on urban violence in Sub-Saharan Africa funded by the Volkswagen Foundation and is dedicated to examine the link between land use and opportunities for crime prevention.

The study on changing land use(s) and their impact on the criminal violence was carried out in Dandora neighbourhood and can be useful in further crime prevention. The study was guided by a combination of complementary theories, such as opportunity and situational crime theories, which help to understand the structure of criminal opportunities in context of the physical environment.

Research on crime and violence in Kenya's residential areas

Changes in land use have, through new development and redevelopment, had an impact on the routine activities of people, which in turn create or alter opportunities to commit crime. This has been acknowledged by social disorganization theorists, routine activity theorists, and situational crime prevention theorists, as well as environmental criminologists. However, profiling of land use changes in relation to crime prevention is still exceptional, as most studies focus on the causation aspects, without addressing the contextual part.

Previous page: Kids playing with timber guns in Kibera informal settlement in Nairobi. Photo: Kosta Mathéy

In addressing the contextual part, this study sought to answer the following question: Does the type and nature of land use change(s) in a

neighbourhood explain crime occurrence and its prevention? This will enable contextualization of land use changes in relation to neighbourhood crime prevention.

In answering the main question, a number of sub-questions have been formulated:

1. What is the crime pattern in the area?
2. What drives land use transformation experienced in Dandora?
3. Are there crime(s) attributable to land use transformation?
4. What is the implication of land use transformation on crime prevention?
5. What are the existing crime coping mechanisms and preventive strategies adopted individually and collectively?

Theoretical framework

A number of theoretical approaches have sought to explain urban crime by criminologists, sociologists, urban planners, and geographers. Criminologists and sociologists tend to believe that crime results from social stress and conflicts and that the rates of crime in urban neighbourhood are highly affected by the demographic and socio-economic contexts (Reith, 1996). The theoretical frameworks explaining the interaction between land use and crime incidences can be divided into two categories, namely:

- Compositional frameworks, also known as *non-ecological* theories such as classical, formative, and social control theories, and

- *Ecological frameworks*, such as positivists, place-based (situational crime prevention), structural-functional, social-disorganization, broken windows, routine activity, rational choice, and situational crime prevention theories.

Both concepts use different units of analysis to explain crime.
This study largely relies on two interrelated ecological theories namely the *routine activity* and *social control disorganization theories*. The latter theory focuses on the ability (or lack thereof) of residents of a spatial territory (e.g. a neighbourhood) to collectively achieve a common goal, like reducing predatory crime. The routine activities theory, on the other hand, focuses on the presence of opportunities for crime in an area, as shaped by residents' daily activities, which, in turn, are molded by land uses. The interaction of the two theories harmonizes analysis of both individuals and community in relation to land use. The two theories suggest different levels of analysis: social control theory considers community explanations for crime, while routine activities theory is often interpreted as focusing on the individual, with three distinctive actors: the offender, victim, or the guardian.

Munda (2004:663) noted that each theory can continuously add new relevant qualities/attributes that must be considered when explaining, describing, or forecasting individuals' behaviour (i.e. human systems are learning systems). The strength of the multi-contextual theoretical framework is evident as no single theory and theoretical analysis can

simultaneously explain crime incidences in relation to land use changes and was infused in the data collection and analysis for this study.

Conceptual framework

As mentioned before, the study conceptualizes the land use and the alteration of the physical environment as an important factor in explaining a concentration of violent criminal activity in a given neighbourhood. Planned land use transformation has potential for being the most peaceful way of managing and preventing violent crime as land use decisions inform the condition and use of spaces, which later influence the nature of activity generation, pace, and intensity of space use.

Land use regulations tend to be rather static whereas in practice the functions performed in any given location, whether residential, productive, or administrative shift over time and depend on many factors, which can be local, national or even global (UN-Habitat, 2005). In the case of the intensification of land use development in Nairobi, Kiamba (1986) drives a continuous process of re-zoning, either informally (means: illegally or criminal) but also formally by raising maximum allowable zoning and development densities. This process also provided opportunity for land owners and developers to fully exploit the economic yielding capacity of
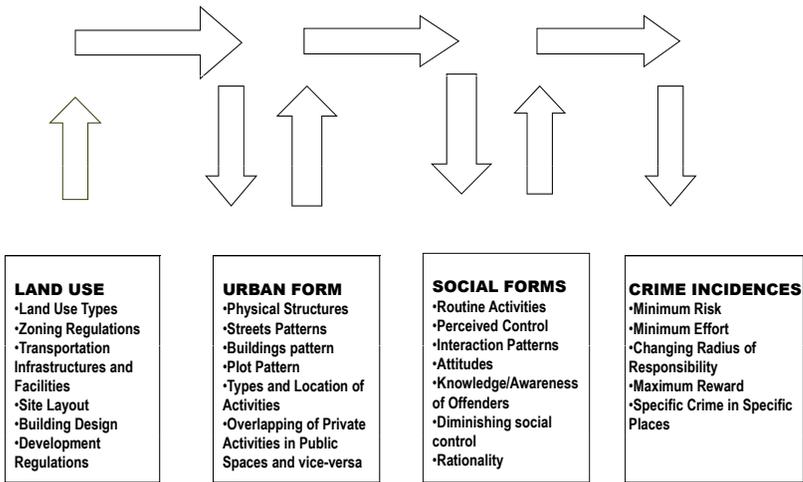

Figure 1:
Multi-Contextual Conceptual Framework Linking Land Use and Crime Incidences. Adapted from Cahill, 2005

LAND USE
•Land Use Types
•Zoning Regulations
•Transportation Infrastructures and Facilities
•Site Layout
•Building Design
•Development Regulations

URBAN FORM
•Physical Structures
•Streets Patterns
•Buildings pattern
•Plot Pattern
•Types and Location of Activities
•Overlapping of Private Activities in Public Spaces and vice-versa

SOCIAL FORMS
•Routine Activities
•Perceived Control
•Interaction Patterns
•Attitudes
•Knowledge/Awareness of Offenders
•Diminishing social control
•Rationality

CRIME INCIDENCES
•Minimum Risk
•Minimum Effort
•Changing Radius of Responsibility
•Maximum Reward
•Specific Crime in Specific Places

Figure 1 illustrates how Land use and the built environment play a pivotal role in shaping the occurrence and patterning of criminal activities. Land use and land use changing patterns in individual neighbourhoods can have impact on residents; various activity choices, such as when and where to be engaged in which activity, including the possibility of being engaged in crime. It further shows that physical forms such as buildings enhance natural surveillance; accessibility networks also produces and reproduces various social forms which lead to certain patterns of interaction. This influences residents' routine activities and the presence or absence of guardians watching over the users, which may inhibit or promote incidences of crime in a neighbourhood.

the given spatial unit, and individually benefit from the social and economic process of urbanization (Kiamba, 1994).

Land use transformation, whether achieved by legal or illegal means, can either improve or worsen the security aspects of space. For example, according to the Muchai, (2001) on *Kenya Crime Survey, conducted in (2001)*, notes that land use conversion from residential to commercial was followed by sharp rise in rental fees in Central Business Districts. Lower income housing was converted into shops and executive flats while crime rates went up simultaneously as same report highlights.

Central Business Districts are unique in every city, whereas different types of residential districts repeat each in the same municipality or countrywide. Therefore this study concentrates on the neighbourhood scale (Dandora in this case), which was chosen as an example for the most immediate planning context, or unit and in which people live and conduct their livelihoods. Neighbourhood is understood within a "place" concept in which urban violence and crime as well as land use transformation will be analyzed.

Case study on Dandora

Dandora is located in the South Eastern suburb Embakasi in the Nairobi East district. It was developed from 1977onwards under the site and service scheme for low income households, partially financed by the World Bank, with the aim of providing shelter for the urban poor who could not otherwise afford decent housing. However, as shown in various pieces of literature, the original allottees did not take full advantage of this opportunity because of their financial constraints. Many of them ended up selling their plots to richer families or entrepreneurial developers, who later on developed multi-storey blocks and commercial buildings.

Dandora has the third highest population in the Division with 142,046 inhabitants (GoK, 2010) and covers an area of 3.9 km² resulting in population density of 3625,4 inhabitants per hectare. In the 1990s, the United Nations rated Nairobi as one of the world's most crime ridden capital cities and within that city, Dandora was perceived to be one of the most unsafe residential neighbourhoods (KIPPRA, 2004).

According to Skogan (1986) stability in a neighbourhood requires that neighbourhoods, as social systems, reproduce themselves.

Left: Dandora sites-and-services housing scheme in 1979.Photo: Kosta Mathéy

Right: Dandora informal development for commercial income generation 1979. Photo: Kosta Mathéy

Map 1: Location of Dandora in Nairobi (Source: Adapted from Survey of Kenya)

Dandora (shaded brown) was the first community development housing project in the East of the city. Dandora is located in Embakasi Constituency,which is the largest con-stituency in Nairobi. It borders Kassarani to the North and Maka-dara to the West.

Neighbourhoods are stable if the housing stock is continually repaired and renewed and if people can sell and buy or rent homes at prices appro-priate for the structures and the social class of the resident (1986). However other studies of low income urban housing projects in Africa show that, like Dandora, very few of such projects reproduce themselves since they are infiltrated by medium and high income earners from a very early stage in their development.

Dandora's land use transformation

The factors explaining Dandora's land use transformation are in them-selves, multi-contextual and can be characterized as follows:

- Penetration by higher income groups, both as landlords and tenants.

- Lack of development control, such as on-plot economic activities including the constraint of uses such as beer halls and other drink-ing places.

- Informal interference in allocation by the Nairobi City Councilors and council officials.

- Eviction of owners from the plots in cases mortgage arrears

- Renting of entire houses by absentee allottees who found the rental income preferable to being accommodated there themselves

(UNCHS, 1987:65). , a number of allottees moved from Dandora to other informal settlements like Mathare Valley or Korogocho.

- In-migration of lower-income individuals due to rent increases in other parts of town (UNCHS, 1987:63).

- Delays in completion of the commercial centres and markets in Dandora led to flourishing small businesses within Dandora, which is related to the reputation of insecurity (UNCHS: 1987:68).

Hence, Dandora represents a case of an unstable neighbourhood incapable of renewing itself. Financially the initial low-income housing project it was a failure as many of the poor were unable to service the loans and more affluent families moved in. Later on, investors started developing cheap high rise apartment buildings and commercial spaces. That process not only altered the land use but also changed the image, aesthetics, and dreams of the community. The estate has earned a bad reputation because of the high crime rates and for it's population density. The initially provided infrastructure and community facilities are highly insufficient for occupancy rates prevailing in Dandora today.

Map 2: Spatial Layout of the Phases of Dandora . Source: Adapted from HDD Original Map of Dandora.
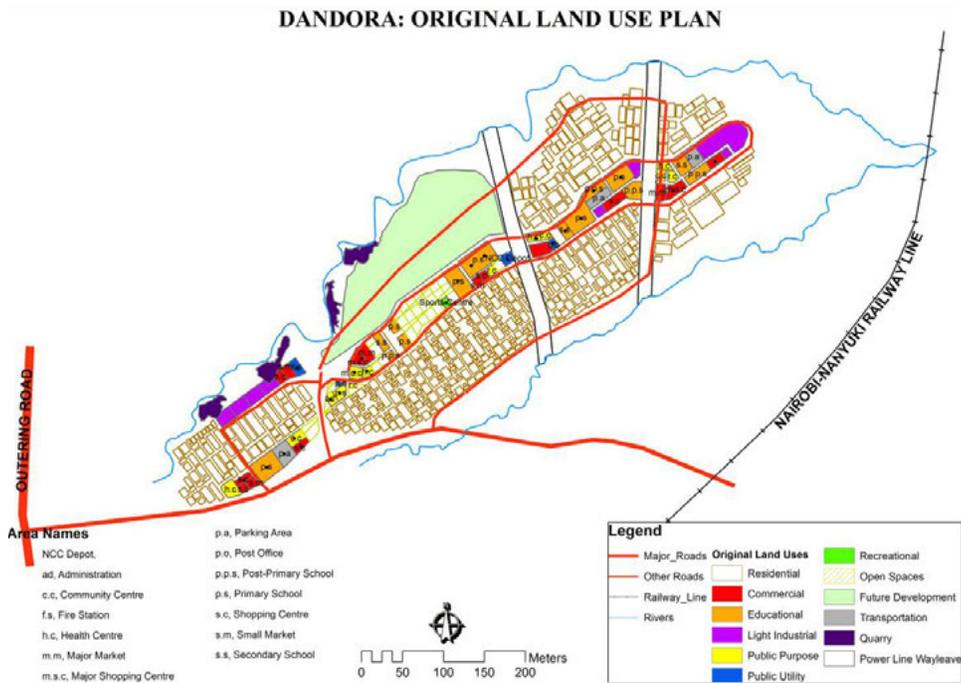
The Dandora Community Development Plan was organized around a central core of public facilities and amenities. It was divided into six residential areas.
There are corner shops located in various strategic locations. However, the central core is the major centre for various community facilities and services, which include primary schools, health centres, and a multi-purpose community centre incorporating day care facilities, sports facilities, and markets (Soni, 1981; DPU, 1983; UNCHS, 1987).

Primary problems associated with land use changes in Dandora

In relation to housing demand, it was noted that Dandora is one of the estates which is most attractive to those who have just moved into Nairobi and need to rent housing as they do not have stable incomes and only chose the neighbourhood for lack of better alternatives.

Several problems associated with land use changes in Dandora were identified in the course of the research (see Table 1). High population density coupled with disinvestment in public infrastructure were responsible for poor sanitation (especially blocked drains, which have been blamed for cholera epidemics and other diseases), strain on other available services (mainly associated with the population pressure), and traffic congestion. The commercial development attracted operations by the Mungiki gangs,[2] who harassed residents (28.1% affirmations) and business people (33.1%) from whom they demand regular 'protection' fees.

These high levels of perceived insecurity and fear of crime and violence led to further disinvestment in the older residential areas and implied restrictions in personal mobility.

02.
Mungiki is a terrorist organization in Kenya

Problems	Residents	Enterprises
High levels of insecurity/harassment by Mungiki	28.1	33.1
Pollution/Poor sanitation/health risks	22.2	7.2
Strain on available services and utilities e.g. sewer lines	19.8	26.6
Congestion resulting from overpopulation	7.1	18.7
High house rents/Business premise rents	6.8	4.2
Poverty and unemployment	5.1	0.0
Inaccessibility due to congestion/bad roads	2.1	0.0
Harassment by Police	1.5	0.0
Noise pollution by bars and public transport vehicles	1.5	1.5
High fares	1.5	0.0
Poor planning/housing provision	1.2	2.4
Lack/ inadequate street-lighting	1.2	0.0
Inadequate recreational spaces	0.9	1.8
Tribal clashes	0.9	0.0
Increased prostitution	0.3	1.5
Total	**100.0**	**100.0**

Table 1: Major Problems Encountered Associated with Land Use Changes. Source: Field Survey, 2009

Left: Housing development in Dandora in 2010. Photo: Kosta Mathéy

Right: Commercial development in Dandora, 2010. Photo: Kosta Mathéy

High levels of insecurity in Dandora which are associated with the like-lihood of driving law-abiding residents away, especially those whose income enables them to do so Power (2004). This is further explained by Taylor, (2001); Sampson and Raudenbesh, (2004), who argue that such situations make neighbourhood less stable because of its bad status and perceived identity.

Crime patterns in Dandora

Robbery was found to be the leading type of crime in the area as reported by business people and residents. This was followed by burglary, assault, and carjacking, rape and kidnapping. Except for burglary and pick-pock-eting these are all violent forms of crime. The survey findings seem to confirm the official police crime record indicating that robbery is the leading crime in the area and also that the area experiences violent crime. The study findings in relation to victimization and crime reporting show that there was an increase of violent crime incidences in Dandora over the period from 2007-2008, mostly attributed to the political campaigns and post election violence in 2007. Business enterprises were the major casualties. The findings also show that the neighbourhood also suffers from under-reporting of crime, with 42% of business people and 41% of residents not reporting crime. Fifty eight per cent blame the police for not taking action on reported crime. The reasons are in line with Shaw and Carli's (2011) notion that crime reporting is based on the effectiveness of police response; this consequently leads to the lack of community trust in the police and legal system to effectively apply justice.

According to police records and the community policing group, crime occurrences were said to be influenced by the following factors: land use activities, time of the year, day, political campaigns, knowledge of the neighbourhood, unemployed youth, nature or status of the building, availability of crime deterrent such as gates, perimeter walls, security personnel, and location of various uses. These findings partially support Brantingham and Brantingham (1993) who noted that crime events occur at a specific site in a specific situation. The complex interaction of these causal factors can possibly be approached by the multi-contextual framework which was noted by Stucky and Ottensmann (2009). These authors related land use patterns with the alteration of routine activities

Incidents of crime in Dandora (survey results)	Residents	Enterprises
Robbery	57.5	18.9
Burglary	15.0	18.1
Assault	17.9	17.9
Car Jacking	1.3	16.2
Rape	15.8	
Kidnapping	11.7	

Table 2: Incidents of Crime. Source: Field Survey, 2009

over time and noted how such alterations potentially influence opportunities for crime.

Map 3 shows the crime hotspots and violent crime prone areas identified by both the households and community policing members. Crime hotspots were associated with different land uses and ranged from residential, commercial, transport oriented, and public utility in Dandora. Areas associated with crime were:

1: DUMPSITE & BOREHOLE AREA
Criminal Hideout zone, Crime Planning area, Mugging zone, Arms store

2: WAMWARE STAGE
Muggings, Robbery, Petty thefts

3: BETWEEN WAMWARE STAGE AND TOTAL PETROL STATION
Robbery, Stealing goods from moving vehicles
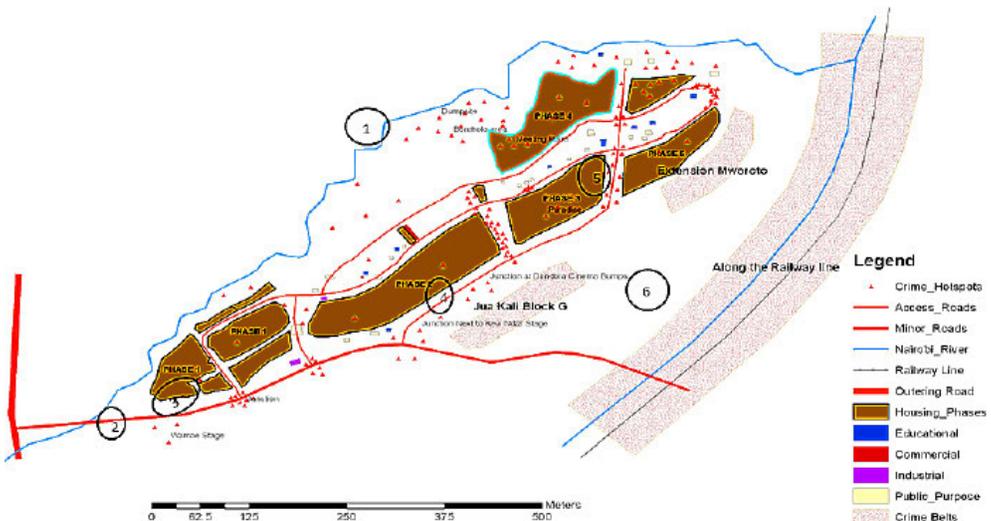The many bumps in the area make it attractive for such activities

4 & 5: JUA KALI BLOCK G & Phase 5 EXTENSION MWOROTO
Muggings, House break-ins, Robbery with violence
The area is a slum and this is contributes to crime activities

6: ALONG THE RAILWAY LINE
Hideout zone, Rapes, Muggings, Drugs/Changáa brewing, Arms store, Robbery with violence

Map 3:
Crime Hotspots in
Dandora.
Source:
author 2009

There are many incomplete buildings in the area and this has made them easy criminal hideout zones

The leading causes of crime as interpreted by the Dandora community are unemployment (30.1%), poverty (17.2 %), and idleness among the youth. Other causes such as the proximity of the dumpsite (5 %) and

lack of development control are also acknowledged. As noted in the theoretical framework section above, the interactions between the compositional and ecological factors are important in understanding the context of crime and responses to it.

Police records suggest a slight reduction of crime in Dandora over the last years, but community policing members think that these figures are not representative because crime is rarely reported to the police. Community policing members[3] and the area chief[4] noted that a "Criminals' Exchange Program" was emerging in Dandora: criminals living in Dandora provided details on targets in their area to criminals living in Korogocho, Kayole, or other settlements details and vice versa. When crime occurred, the perpetrators seemed to have intimate knowledge of the area and potential target(s).

Crime response and coping mechanisms

Table 4 lists the prevention measures taken against the threat of crime and violence by the interviewed respondents. A closer look at the responses shows that 79.5% of the measures are individually oriented, which coincides with the World Bank report (2010) that found crime coping mechanisms in many urban areas mostly individual rather than collective.

Incidents of crime in Dandora (survey results)	%
reporting to the police/community support centre	30.2
going home early	19.8
avoiding danger spots	12.4
community policing	9.9
walking in trusted company at late hours	15.8
hiring watchmen	11.7
having gates and closing of gates early	5.0
mob justice	3.7

Table 4: Crime response patterns in Dandora. Source: Field Survey, 2009

03.
Community policing focus group discussion conducted on 29th November 2009, at Holy Cross Catholic Church in Dandora phase four.

04.
Key informant interview with the Dandora chief conducted in the chief's camp on 15th of March 2009, in Dandora phase four.

Various arguments about effectiveness or coping strategies were raised. 41.2% of respondents said that increased visibility and ruthlessness of security personnel, commonly known as the "Kwekwe Squad", had led to the switch in crimes becoming less violent. Community policing members revealed that the high crime rates left community members with little choice for protection other than deliberately forming a group that could defend the neighbourhood. It was also noted that the current practice of community policing had a long historical background, and was similar to most low income neighbourhoods of Nairobi. They argue that when communities don't act on their own and wait for police, crime levels tend to rise.

This statement relates to the rational choice theory: in their analysis of criminal location choice Bernasco and Nieuwbeerta (2005) explained that the target choice of an individual offender reflects a comparison of the attraction of all potential target areas against the risks and resistance that can be expected.

Another frequently expressed opinion says that high level of violence has caused considerable residential mobility and migration away from Dandora – some of the leaving families enter into zones that operate road closures.[5] Many premises have changes from residential to commercial use and vice-versa in response to market demand. This has contributed to what Skogan (1986) referred to as an unstable neighbourhood, were there is no consistent community feeling and no collective defense arrangement – implying relatively easy play for criminal ventures.

The collective protection strategies adopted in Dandora, such as community policing, aim at taking charge of security communally. The policing groups team up with other community-based organizations[6] and occasionally organize activities and functions that bring the community together. This provides residents with a platform to meet and know each other and engage in community activities.

The different crime prevention strategies are acknowledged to carry bothpositive and negative results: residents and enterprises believe that they result in a reduction in crime (70.3% for residents and 43.1% for enterprises) and bring neighbours closer to one another regardless of tribe and other status (12.6% for residents and 25% enterprises), which counts on the positive side . Negative impact would include limitations to economic activities, since most residents cannot afford to conduct their businesses until late in the evening (9.9% for residents and 16.7% for enterprises), and keeping the family indoors at night (7.2% for residents and 15.3% for enterprises), which is mostly practiced by parents worried about the security of their adolescent sons and daughters.

Land use impacts on crime dynamics

Key informant interviews with Kenyan police officers confirmed the evident correlation between land use and types of crime, whereby the time of day (or night) represents a third variable. As shown in Table 5, in low-density (middle-income)residential areas theft by servants was high in the daytime while robberies typically occurred at night but are not very frequent since most of the houses are guarded or had alarm systems. However, in high density residential areas waylaying and pick-pocketing was common during daytime while robbery, break-ins, and muggings

05.
A road closure means that the through roads are blocked and the remaining access road gated and equipped with guards. The idea is similar to a 'gated community' except that it happens inside the existing urban texture rather than green field development.

06.
Such as YARD, DYMES, Dandora Women Forum, Dandora Uprising, Vision, Wafraha, faith based organizations, Hope Worldwide, and Goal International Kenya, among others.

mostly happen at night. In most transportation nodes, petty theft such as snatching of mobile phones are a common nuisance during daytime while at night carjacking, assault and robbery with the added aspect of violence were frequent.

Land Use	Type of crime	
	Daytime	At Night
Residential- Low density e.g. Runda, Karen etc	Theft by servants	Robbery (rare)
Residential- High density e.g. Kayole, Dandora etc	Waylaying, offences against persons	Robbery, breakings, mugging
Industrial	Muggings-Hovering/roaming robbers from adjacent residences	Muggings
Educational e.g. Schools, colleges	Corruption, Economic crimes, Violent Crime Not Common	Break-ins, Theft by servants or watchmen
Recreational e.g. Uhuru Park, National Park	Muggings, Offences targeting tourists	Rape, Assault
Public Purpose e.g. Churches, Social halls	Theft of vehicle parts in the parking lot	Break-ins
Commercial	Stealing, Theft by servants	Theft by servants
Public Utilities e.g. dump sites, road reserves	Muggings	Rape
Transportation e.g. bus stops, roads	Petty theft, pick pocketing	Assault, robbery with violence, carjacking
Undeveloped and open spaces	Waylaying, assault and rape	Rape (offences against morality)
Mixed Use e.g. Shop and Residential		Public nuisance

The linkage between crime incidences and unpopulated land appears surprising at first sight. But the absence of other people in deserted locations, like the dumpsite, deferred building sites or agricultural land will delay the discovery violent crime – an advantage for any perpetrator. On the other hand, congestion in high density areas and busy commercial streets facilitates to approach a victim without being noticed by the same, and in the same way to disappear again in the crowd.

Most of the reasons associating distinct land uses with various sorts of crime of violence have also been described in the literature: Chamlin and Sanders (2008) noted that undeveloped land can be crime-ridden because it usually is overgrown with vegetation, unlit and offers hiding places for stolen good, drugs, corpses and the perpetrators themselves.

Concerning development control, the situation in Dandora confirms the experience of most low income informal settlements in Kenya, as noted by Koti (2000). Lock of coordination between the Central Government and local authorities has hindered well orchestrated land development in

Table 5: Perceptions on Land Use and Crime[07]

07. Based on the interviews with the Nairobi PPO, Buruburu OCPD, and Dandora OCPP on 27th of May 2009, 25th of March 2009, and 26th of March 2009 respectively

most Kenyan cities. In Dandora this is manifested by an overriding influence by the provincial administration and its development control which often clashes with the policy of the City County of Nairobi. Legitimate urban development is halted and informal development mushrooms. In an optimistic perspective, Hentic (1997:369) notes that until local government possess the legitimacy, credibility, and ability to perform their functions effectively, the generalized non-transparent land use control continues to impact negatively on the living conditions of citizens.

Conclusions

Faced with high rates of crime and deficient protection from the police, the local community in Dandora relies on various forms of community based and individual violence prevention strategies. But also these do not seem to be working fully due to mistrust among members of different ethnic groups. For example, these initiatives regularly break up during political campaign periods, as different ethnic groups become protective of their own clans, and at times even protect suspected criminals belonging to their own ethnical group.

Nonfunctional land use management prevents to consider violence and crime prevention concerns in urban development practice in Dandora – although a two-way correlation between violent crime and different land use forms is an acknowledged fact and supported by different theories.
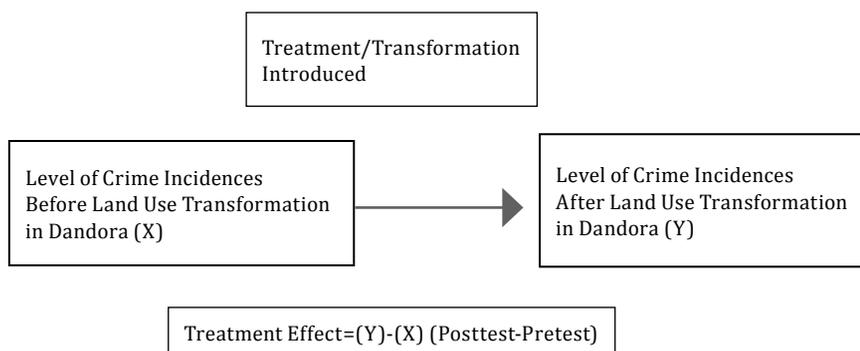
The different theories are part of the multi-contextual theoretical framework introduced at the beginning.

- The *routine activity theory* proposes that land use changes led to changes in human behavior, legal, illegal or even violent. It explains the interaction between offenders and victims.

- The *social disorganization theory* argues that rapid (land use) changes in a neighbourhood can weaken social cohesion in a community, leading to rising cases of crime and fear of crime as a secondary consequence.

- According to the *rational choice theory* maintains that those perpetrators decide on the location of their activity also on the physical suitability defined by land use patterns.

However, the findings do not empirically support the *defensible space theory* or the *broken windows theory*, although the study's theoretical framework confirms that land use transformation leads to a change in neighbourhood form. The built environment plays a pivotal role in shaping the spatial pattern of criminal activity. While certain combinations of land use and design elements can foster criminal activity by blocking lines of sight and providing easy access to potential targets, other combinations can virtually eliminate the opportunity for criminal events (Wuscke et al, 2010).

Annex: Methodological Remarks

Given the limitations of systematic randomization, the study employed the use of non-equivalent groups before (pre-test) and after (post-test) design. In this design, the crime incidences (dependent variable) were measured both before and after land use transformation, as depicted in Table 6. The main difficulty of such a design, as noted by Beins (2004), is that with the passage of time, considerable extraneous variations may develop in its treatment effect. In minimizing the extraneous variations effect, the study made use of interrupted time-series design, which makes use of numerous pre-tests and post-tests. In this case, as noted by Kazdin (2003), periodic measurements were made on a group prior to the interruption of the intervention (transformation) to establish a stable baseline.

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                    ┌─────────────────────────────┐
                    │ Treatment/Transformation    │
                    │ Introduced                  │
                    └─────────────────────────────┘

┌───────────────────────────┐            ┌───────────────────────────┐
│ Level of Crime Incidences │            │ Level of Crime Incidences │
│ Before Land Use           │  ──────▶   │ After Land Use            │
│ Transformation            │            │ Transformation            │
│ in Dandora (X)            │            │ in Dandora (Y)            │
└───────────────────────────┘            └───────────────────────────┘

        ┌──────────────────────────────────────────────┐
        │ Treatment Effect=(Y)-(X) (Posttest-Pretest)  │
        └──────────────────────────────────────────────┘
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In order to get the situational analysis of community crime prevention strategies, focus group discussion were conducted with the community policing members, representing all the phases of Dandora.

Table 6: Non-equivalent Group Pre-test &Post-test Quasi-Experimental Design. Source: Opiyo, 2011

Surveys were undertaken with three groups of respondents:

1- Residential Land Use (Tenants and Land Owners). 5 phases, total of 144 samples

2- Commercial Land Use (Businesses), 5 phases, total of 121 samples

3- Land use regulators and Security Providing institutions namely Nairobi City County Government, community crime prevention groups, police, and former residents; 10 samples

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