

Validating the Theories of Urban Crime in the city of Raipur

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Abstract: - Crime has carved its new way through unorganized urban life and changing city fabric. The urban fabric of any city can be reason for the crime to happen and at the same time it can contribute for its prevention. It has been always a question in the research works of many designers, planners, criminologists to get advanced in terms of design which will curb crime in different parts of the cities. This paper discusses about the establish important relationship between nature of crime and urban fabric by the researchers and presents a model in the form of five parameter of urban form which indicates that by emphasizing on these parameters can solve the problem of crime in the city. These parameters changes with nature of the city as it further adapts the variables engraved in each fabric of the city. The proposed parameters for Raipur city are: accessibility, legibility, occupancy rate, territoriality and natural surveillance.

Key words: *Urban form, crime, fear, accessibility, legibility, surveillance, territoriality.*

I. INTRODUCTION

Raipur city is the capital city of Chhattisgarh. The city structure of Raipur is defined by a strong nucleus which is the intersection of GE road as NH 6 acting as east west axis and NH 200 as north south axis. It acts as a major node for commercial and public / semi-public activities. The growth of the city is apparently guided by the NH-6 which runs on the southern periphery of the city and restricted along the northern side by the railway line. This led to the growth of industries and wholesale markets and go-downs along it which triggered the expansion on the northeastern and southwestern side of the city. Now with the commencement of Naya Raipur, as “New Capital City”, Raipur is playing role of transitional route between Naya Raipur and other western parts of Chhattisgarh. Although the above description portrays Raipur as major developing city of Chhattisgarh, the growing commercialization and industrialization in the city, led to migration from nearby cities, making it as fulcrum of major criminal activities

Table 1: showing the NCRB file record of crime between 2008-14 in Raipur District

Year	Murder	Rape	Abduction	Dacoit	Robbery	Burglary	Theft	Riots	Dowry	Sexual assault
2008	28	36	22	3	14	45	50	3	08	50
2009	32	45	36	7	20	48	58	5	11	52
2010	36	48	40	8	24	50	60	5	15	59
2011	40	52	56	8	29	52	65	7	07	65
2012	45	56	60	9	35	56	70	8	11	70
2013	48	60	68	11	38	59	72	9	06	75
2014	50	65	70	12	42	62	80	11	05	80

With reference to statistical data of 2008 to 2014 of National Crime Bureau of India (NCRB; File Record, 2014, Raipur) , which shows that there is a marked trend of incremental growth in crime rate. More than 50 percent of crime has happened in few selected areas than in any other part of Raipur city. The connection between crime and city size is not a new fact. Criminologists have discussed the urban tendency toward crime for decades like Flango and Sherbenou [1976]; Schichor, Decker, and O'Brien [1979]; Larson [1984]; Radzi-nowicz and Wolfgang [1977] in their book Crime and Justice. Wirth (1938) discusses the observed connection between crime and urbanization in his theory of “urbanism as a way of life.” Social observers such as Jean-Jacques Rous-seau (Confession; 1782) have long argued that there exists a connection between cities sizes and immoral behavior.

All Crime is kind of disease and should be treated as such” (Mahatma Gandhi quoted as Indian Philosopher, internationally esteemed for his doctrine of nonviolent protest, 1869-1948). Adhering to this

statement, many authors' talked about the reason behind the emergence of urban crime, which in-turn defined by the different urban fabric of the city.

Literature Study

1. Palimpsest of Theories

Crime has been in study and theories of many authors since 1960. It started with first recognized study by the Elizabeth Jean Wood in 1960. She developed guidelines for addressing security issues while working with the Chicago Housing Authority, placing emphasis on design features that would support natural surveillance and then Jane Jacobs carry forwarded this concept as "Eyes on Street" in her book "The death and life of American Cities" in 1961. She stressed upon the importance of natural guardianship in the environment. Presenting the concept of natural surveillance with a new feature added, Schlomo Angel talked about "Surveillance Accessibility" in his Ph.D. thesis, Discouraging Crime through City Planning, (1968). He argued upon the increase in crime through increasing territoriality and suggested "visual accessibility" to prevent crime in urban areas.

To study crime under an organization, Crime Prevention through Environmental Design (CPTED) was created and it was originally coined by C. Ray Jeffery in 1970. Jeffery developed the first theory, the Opportunities theory, under the title CPTED, in which he suggested "With urban design and the planning that goes into the creation of new and reformation of older communities, citizens in these neighborhoods and places of business can feel safer at all hours and urban design, including the design of streets, parks terminals, super highways, etc, could prevent crime by reducing the "opportunities". This theory was expanded by Mayhew, Clarke, Sturman and Hough (1976) and Clarke and Mayhew (1980) in their work for the UK Home Office Research Unit, and by Canadian researchers Brantingham and Brantingham (1981).

In 1972, Oscar Newman gave the theory of "Defensible Space" in his book "Creating Defensible Space". In this theory author established the vital relation between crime and environment. He worked on the Schlomo Angel and suggested to increase the physical accessibility to curb crime.

Aimed at predicting the effects of modifying both the external environment and the internal environment of individual offenders, particularly stressed upon the occupancy rate, physical appearance of built form, C. Ray Jeffery, Oscar Newman & others developed "Behavioral model" under CPTED in 1977.

James Q. Wilson & George L. Kelling in 1982, in their theory of "Broken Windows", explored the impact that visible deterioration and neglect in neighborhoods have on behavior and property maintenance was added as a CPTED strategy on par with surveillance, access control and territoriality.

Canadian academicians Patricia and Paul Brantingham published Environmental Criminology in 1981. According to the authors, a crime takes place when all of the essential elements are present. These elements consist of: a law, an offender, a target, and a place. They characterize these as "the four dimensions of crime", with environmental criminology studying the last of the four dimensions.

Author C. Ray Jeffery remodeled the "Behavioral Model" as "An Interdisciplinary Approach", 1990, which assumes that the environment never influences behavior directly but only through the brain. Any model of crime prevention must include both the brain and the physical environment.

Severin Sorensen has developed a curriculum, trained stakeholders in public and assisted housing and follow-up CPTED assessments were conducted at various sites to understand the situation based crime done and its prevention under the head "Situational Crime Prevention" in 1994.

In 1997, an article by Greg Saville and Gerry Cleveland, 2nd Generation CPTED, exhorted CPTED practitioners to consider the original social ecology origins of CPTED, including social and psychological issues beyond the built environment.

II. INFERENCE FROM LITERATURE STUDY

In early 1960s, authors primarily focused on "natural surveillity", to prevent crime. Late 1960s and early 1970s, theory of natural surveillance was further developed in two parts i.e. physical and visual surveillance accessibility. In late 1970s, light thrown on issues of territoriality formation and concept of accessibility and legibility through built form was developed as oppose to territorialization. Authors in late 1980s and early 1990s, explored the impact of physical appearance of urban form on criminal mind and behavior.

III. METHODS

1. Analyzing the data from survey and NCRB

Apropos to statistical data of 2008 to 2014 of National Crime Bureau of India (NCRB; File Record, 2014), Table 01, which shows that there is a marked trend of incremental growth in crime rate in Raipur city. Differentiated the records of Table 01 into city area wise and criminal lawyers of respective areas are interviewed, which gave the following conclusion;

- Most of crime in Raipur is mainly concentrated in stereotype image like Kabir Nagar; First residential colony for retired gentry, Moudhapara; Muslim religion dominating with wholesale market of timber and electronic product, Gudhayari; Slum dominating with government housing colony, Budhapara; Old area with male dominating gathering place, Station road ; wholesale market with hotels and bars.

2. Questionnaires

A short questionnaire to the locals of the most crime affected area (i.e. area as per criminal lawyers interviews) was given to portray their own perception of crime in their locality. This resulted in collection of 25 samples from each of the area. The set of survey sample was again revised and merged with crime data collected from the criminal lawyers and NCRB; Raipur ,which gave final outcomes:

- Murders and rape mostly at the night time along the commercial stretch, wholesale market and residential area of Station road, Kabir nagar, Moudhapara.
- Theft, robbery in residential at night and late noon in Kabir nagar, gudhayari , Moudhapara, Budhapara
- Abduction mostly from the vicinity of vacant residential areas during night and late evening in Kabir Nagar.
- Chain Snatching in isolated roads mostly from interior of commercial areas in Kabir Nagar.
- Prostitutions and drug trafficking mostly in the vacant areas of Kabir Nagar and Station Road
- Sexual Assault in isolated residential areas were observed in deserted areas of Kabir Nagar, Budhapara, and Moudhapara

3. Selection of Study Area:

The selection of study areas are done on the basis of conclusion made in 1& 2 and also in consideration of following points

- Areas with different urban form
- Areas affected by different types of crime: to portray nature of crime with changing nature of urban form.

Based on the above points, following two areas with unlike built form are selected:

1. Kabir Nagar
2. Moudhapara

4. Parameters for study

In consideration with the conclusion made from research theories discussed under head of literature study, following five parameters have been selected to study the selected from city of Raipur:

1. Occupancy rate
2. Territoriality
3. Natural Surveillance
4. Legibility
5. Accessibility

4. Process of Mapping

In this research paper, mapping has been taken as major tool to have an understanding of nature of crime in any area and to find the relationship between nature of crime and the city. The mapping is done in three stages;

- In first stage, mapping of urban form in five criteria i.e. occupancy rate, territoriality, natural surveillance, legibility, accessibility to get the full portrait of crime in both areas.
- In second stage, fear mapping has been done on the basis of survey sample by the locals to find the places of fear
- In third stage, fear mapping has been merged with mapping of urban form which resulted in the final crime map.

IV. FIVE STUDY POINTS

1. Occupancy rate

According to encyclopedia, "*Occupancy in building construction and building codes is the use or intended use of a building or part thereof for the shelter or support of persons, animals or property. A closely related meaning is the number of units in such a building that are rented or leased, or otherwise in-use. The lack of occupancy in this sense is a vacancy.*" Occupancy Rate as "*the number of units in a building that have been rented out as compared to the total number of units in the building.*" In theory of Defensible Spaces, the author Oscar Newman established that defensible space must contain two components. First, defensible space should allow people to see and be seen continuously. Second, people must be willing to intervene or report crime when it occurs. By increasing the sense of security in settings where people live and work, it encourages people to take control of the areas and assume a role of ownership. Through this following conclusion can be drawn;

2. Territoriality:

Newman's defensible space theory assumed that people need to mark out and defend their territory. He believed that a good design would encourage people to express these territorial urges; that is, they would defend their territory from outsiders. A well-designed housing project, therefore, would make clear which spaces belonged to whom some would be completely private, some could be shared with permission from the owner, and others would be public. An important aspect of this is household. This requires management to assign groups in a housing project to environments they can best use and control, taking into consideration ages, lifestyles, backgrounds, incomes and family structures.

3. Barriers:

Jane Jacob in her book "The life and death of American Cities" focused on this term to find the reason of the crime, further Elizabeth wood in 1967, Oscar Newman in his book "Creating Defensible Space" and also James Q. Wilson & George L. Kelling in 1982, in their theory of "Broken Window" talked about this. In this concept, residents casually observe and monitor public and semi-public spaces in their environment and intercept those who do not belong. Residents would only do this if they had developed a territorial instinct about their housing project and felt responsible for its safety. Practically, people must be able to see all the non-private parts of the housing development if they are to help prevent crime.

4. Accessibility

As per English encyclopedia, Accessibility "is the degree to which a product, device, service, or environment is available to as many people as possible. Accessibility can be viewed as the "ability to access" and benefit from some system or entity". Schlomo Angel talked about "Surveillance Accessibility" in his Ph.D. thesis, Discouraging Crime Through City Planning, (1968) and Jane Jacobs argues in The Death and Life of Great American Cities that the urban layout plays an important role in generating urban life, heterogeneity, and urban qualities.

5. Legibility

Legibility in Urban design as defined by Kevin Lynch in his book "Image of the City" *is defined as how the qualities of the built environment make a place understandable.* According to him, concept of place legibility, which is essentially the ease with which people understand the layout of a place. Author C. Ray Jeffery in model "Behavioral Model", talked about the direct relation of surrounding environment and behavior of a person. When a person get in touch with environment, its behavior start reacting accordingly, the environment with absence of legibility feels alien, on other hand when the environment has some signs legibility, it is for anyone to get accustomed to that area. In the same way criminal minds works, it triggers in area absence of legibility.

V. FEAR MAPPING

Fear of place in people perception, it's something; they feel when they encounter with the unknown place, which doesn't have an imagibility in their mind. Taking reference from the survey done in both locals area, the definition of fear of place through the locals of that area, are portrait as area which they never want to visit as its doesn't have proper access, with commercial landuse, one sect of society domination and a residential area which doesn't have sense of community and moreover crime recorded in all this places.

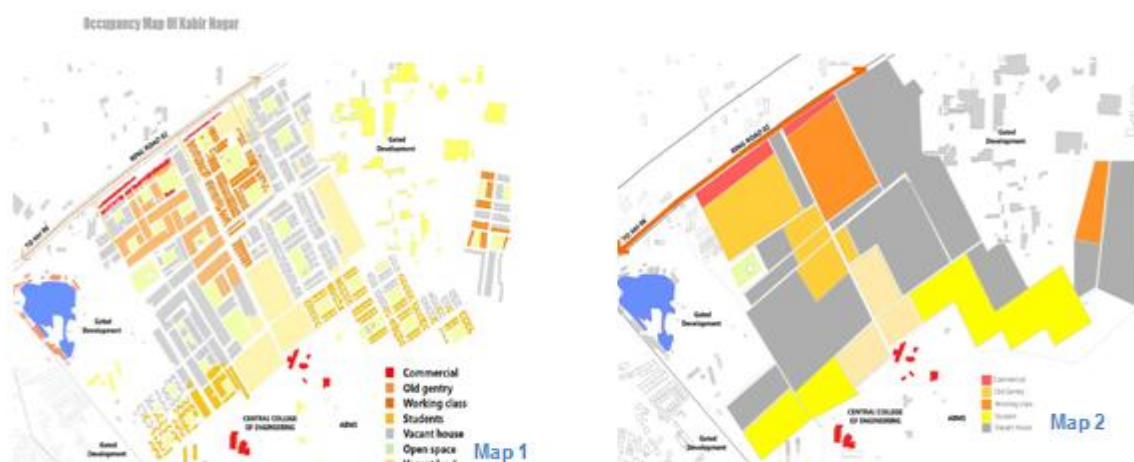
Case Study Area 01: Kabir Nagar, Raipur, Chhattisgarh

Government housing established in 1995 on the northwest part of the Raipur along the Ring road 02, for the retired government employees. It is purely a gridded layout residential colony with one or two storied semi-detached housing and duplexes on eastern part. This area has 50 % occupancy rate with retired gentry living mostly in the single or double semi-detached houses, working class mostly occupied the duplexes and students occupied semidetached houses near institutes on its southern part.

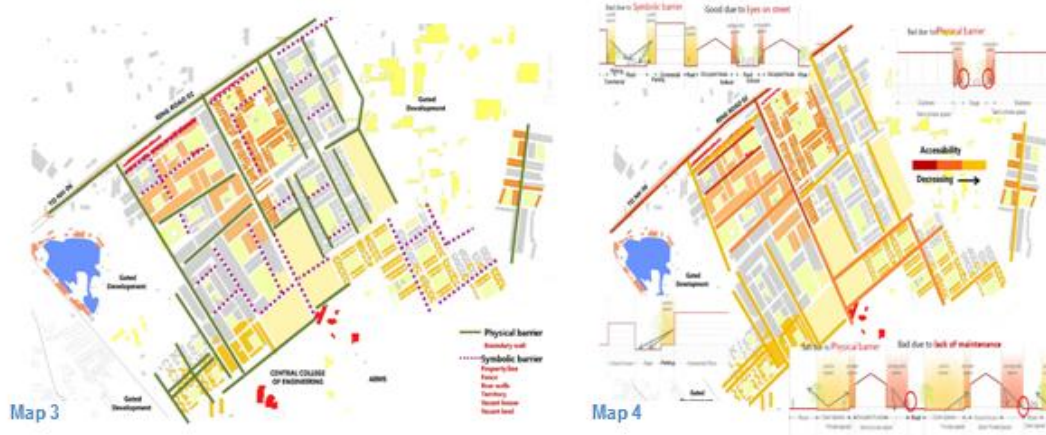
To map the urban form in this area, five points has been mapped down.

In reference to map 01, occupancy rate in Kabir Nagar shows seven classes i.e. commercial, old gentry sect and working class on the entrance, students on its rear part near institutional area with vacant plots and undeveloped open land.

Territoriality in terms of Urban Design is define by the Kind of people, Occupation, caste, creed, culture,age, land use etc. In reference to map 2, Kabir Nagar territoriality is define by the age group and land use i.e. old gentry , where people have public space to gather in evening, group to walk down the alleys in the morning, private space beyond boundary wall to seat and enjoy morning tea and front lawn to take care in their leisure time. Middle age get confined in the gated community to get more security when are they out for work. There is no concept of private space, the spaces within the wall is either public or semipublic where they can enjoy their evening , children can play or space for their possession. Students community mostly occupied the semidetached houses near the institutes. Private space has become public due to lack of natural surveillance.

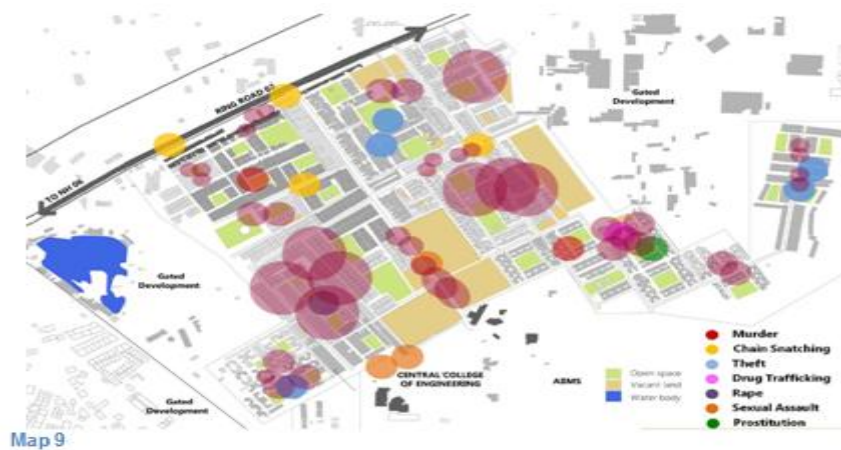
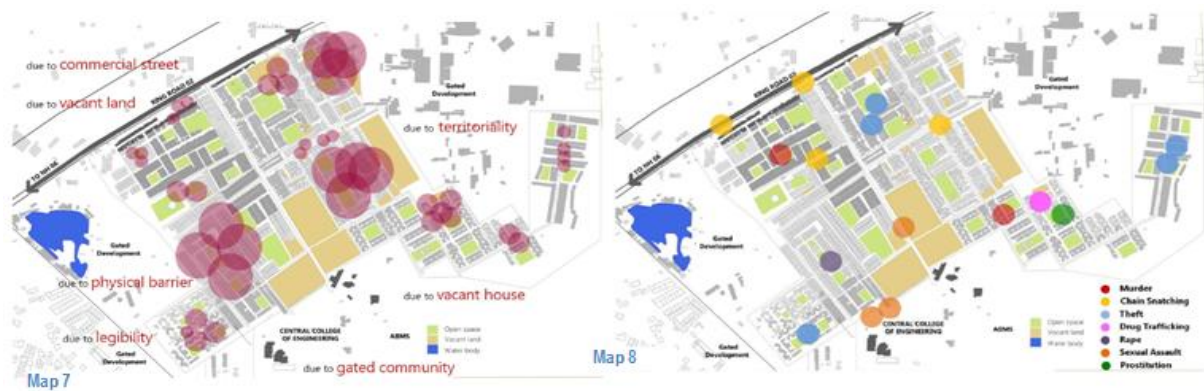


Barriers are categorized in two category i.e. Physical barriers and Symbolic Barriers. Physical barriers are barrier which physically exists in urban space like boundary wall, fence, natural setting, change of level etc. whereas symbolic barriers the barrier which symbolically exists in urban space like property line, signage, change of material etc. Map 3 shows the existence of different type of barriers in Kabir Nagar.



Accessibility study is done in three degrees. This degrees indicate the highest accessibility level, middle and the lowest in chosen study area and they are marked by the decreasing tones of color from higher to lower. Referring to map 4, degree of accessibility decreases in Kabir Nagar from main arterial road to inside lanes of old and middle class gentry as front road is commercial and this road is main road linking to city, so with all amenities, it caters more crowd throughout the day whereas inside lanes has gated row houses with minimal daily need shops, making it less accessibility at particular time of a day. Further, it becomes lowest in student part as it lacks in less maintained amenities or no amenities.

Legibility in Kabir Nagar is undefined with absence of landmarks, signage and similar type of row houses. Somewhere open spaces and vacant lands marked the legibility of that place. Map 5 and 6, legibility is restricted till main road only because of mixed landuse but legibility decreases on moving inside lanes due to similar character.



Map 7 shows the fear map of Kabir Nagar, based on the interviews of locals. It is found that fear is mostly in the area around vacant lands, unmaintained open spaces and vacant houses due to lack of amenities. Also found that most of them fear to go towards the student housing and institutional area i.e. at the rear part after evening due to territorialization of students. From these observations, it can be predicted that areas which are under the ambit of poor accessibility, poor legibility, territorialization, lacks natural surveillance and have low occupancy rate are horrendous.

Map 8 shows the crime mapping of Kabir nagar on the basis of data of NCRB and survey interviews of criminal lawyers. Most of the crime in this area is murder, chain snatching, and theft; drug trafficking, rape, sexual assault and prostitution. If closely observed the nature of crime varies with nature of place like chain snatching is mostly on main road where crowd is more and fast moving traffic, theft in the territory of old people as weak people are easy to suppress whereas crime related to women and drug trafficking are found in the student area surrounded by institutions as this area go dead in evening due to lack of natural surveillance.

Map 9 shows the overlapping of fear and crime mapping of Kabir Nagar. This overlapping is done to find the relationship between the crime and the fear which in turn helps to have correct prediction of relation between urban form and the crime as it already been established under fear mapping that fear is related to urban form. Following conclusion can be drawn by this mapping:

- People fear the most in the places of severe crime or urban form with vacant land, vacant houses and unmaintained vacant spaces.
- They also fears to approach the places of youth territorialization, around institutional area due to crime reported against women or urban form of territories, barriers or occupancy rate
- Fear among people is also due to the organized crime like theft, murder etc. which generally reported in the territory of working class and old gentry or urban form of territories, barriers or inaccessibility.

Fear ∞ occupancy rate1

Fear ∞ Territoriality.....2

Fear ∞ Barriers.....3

Fear ∞ accessibility.....4

Fear ∞ legibility.....5

If we co relate the above conclusion with conclusion made for fear map in eq. 1,2,3,4 ,5 considering fear is directly related to crime, it can be concluded that

Crime ∞ 1/ occupancy rate.....6

Crime ∞ Territoriality.....7

Crime ∞ Barriers.....8

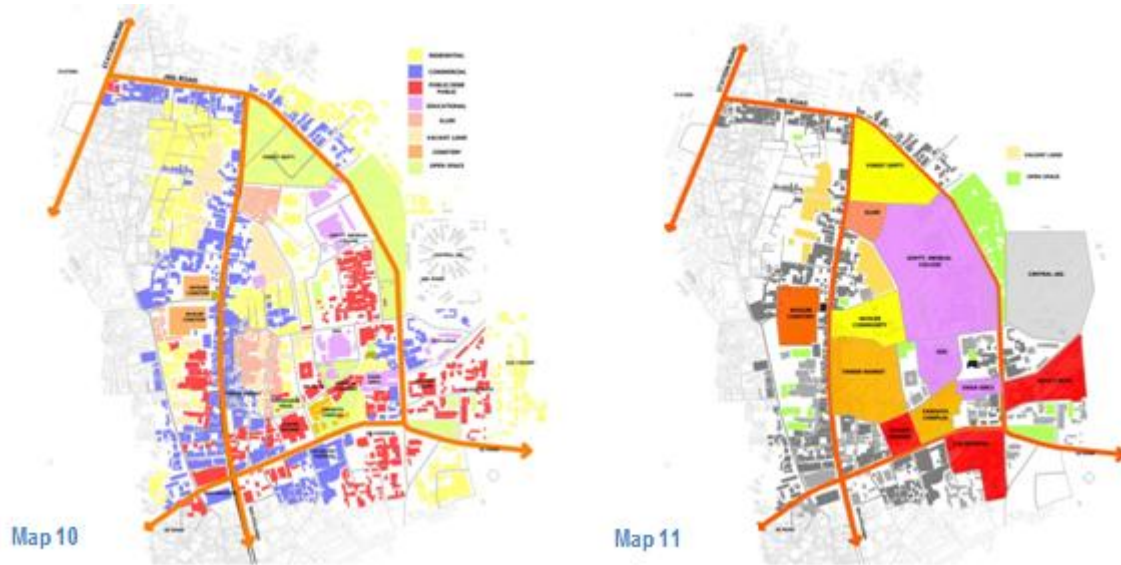
Crime ∞ 1/ Accessibility.....9

Crime ∞ 1/ Legibility.....10

From eq. 6,7,8,9,10 it is proved that urban form is some way contribute to the crime to happen and good urban design have the potential to prevent also.

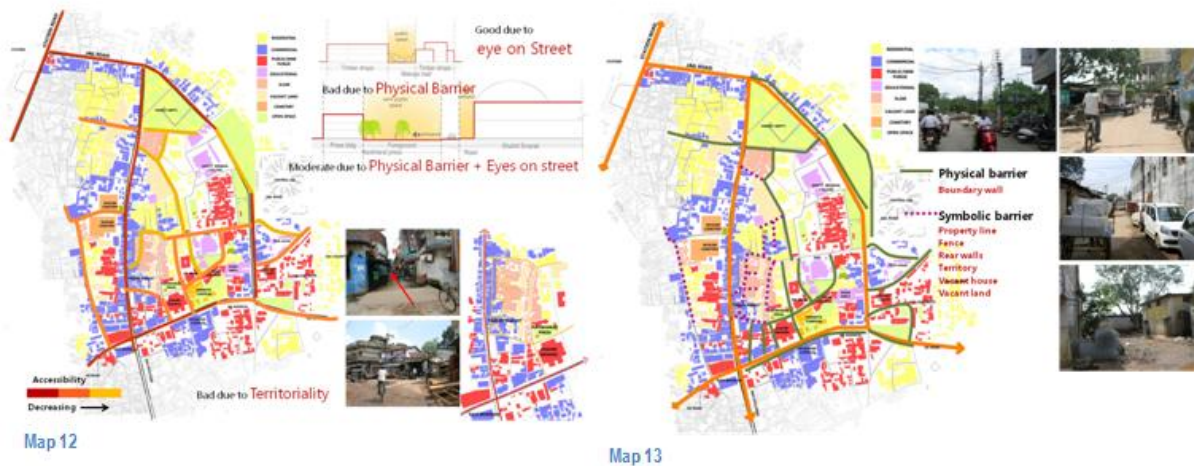
Case Study 02: Moudhapara, Raipur (Chhattisgarh)

Muslims dominated area, forms a important part of the Raipur history, established in the time of Mughal rule at around 16th century. It is the mixed land use area in the central part of Raipur just behind the Raipur Main Station. Being the oldest area, it has the organic urban form with the flourishing mixed type of shops on the main road and workshops, hotels and residential in the internal roads. Also it caters national and state level educational institutes in the heart of it. Some parts of it are dominated by slums mostly employed in the workshop, shop and residence.



With reference to map 10, occupancy of moudhapara is dominated by commercial along the main road, residential and institutions form the middle and inner part of it with cemetery, central jail and timber wholesale market adding to its diversity.

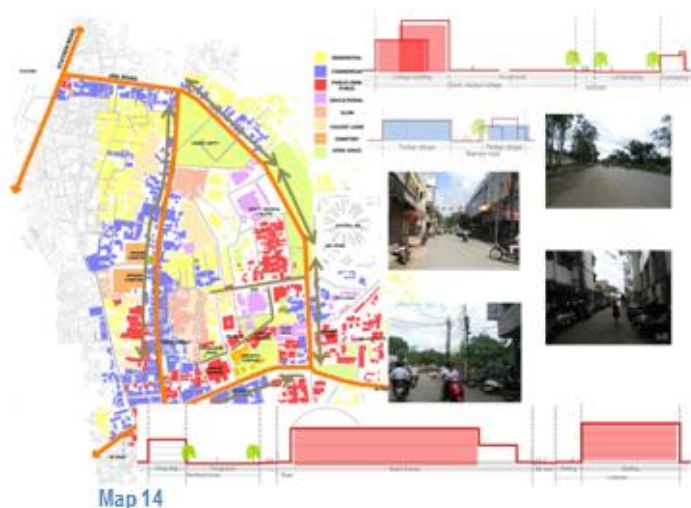
This area has varied territorialization as shown in Map 11. Major part is territorialized by institutions with massive boundary walls and green part, another in queue is the timber markets and Muslims community.



Accessibility in three degrees as shown in Map 12, defined as most on commercial due to all day activities, decreases with decrease in street with less activity as in residential and institutions, it becomes least around unfavorable activity cemetery and slums.

Physical barriers are mostly at institutions part and residential while symbolic barriers are along commercial and slum area as depicted in map 13.

Legibility is only present on the main road as its has some of the historical shops of timber, cemetery and institutions but inside lanes totally lack in legibility due in to inorganic character of residential development as can be seen in map 14.



Map 14

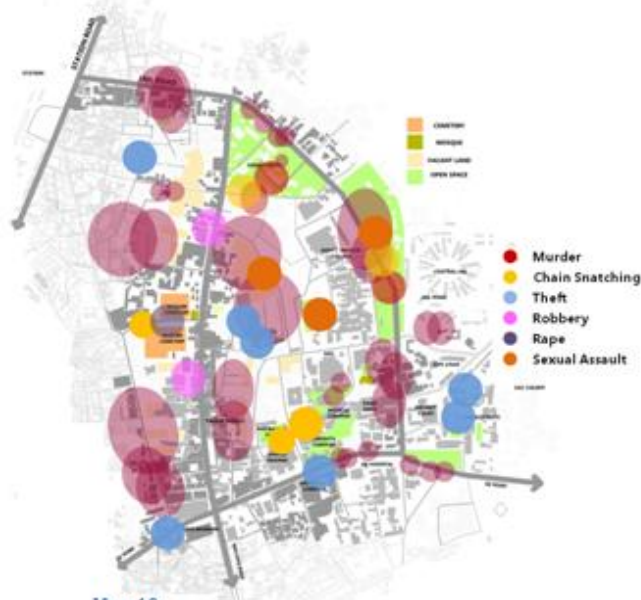


Map 15

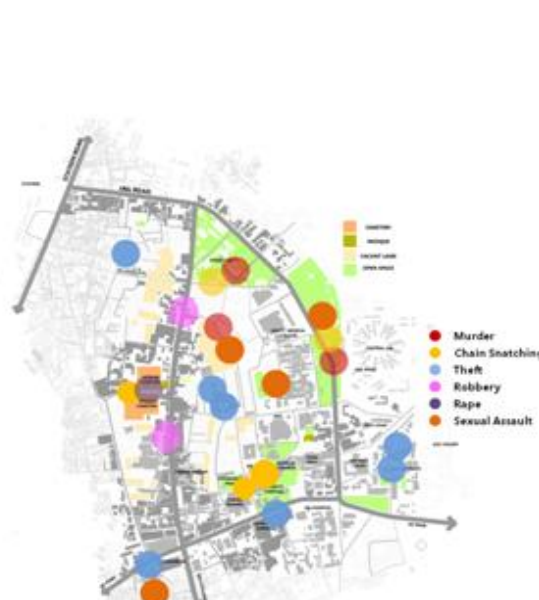
Fear among people in this area mapped in map 15, is due to deserted, unmaintained streets and lanes which also lacks in social interactive spaces, lacks in visual linkages as organically developed.

As shown in map 16, Severe Crime like rape, murder, robbery are housed in slums, residential and institutional area whereas minor crimes like sexual assault, theft etc. are concentrated majorly around timber market, commercial area as portrait by the locals and lawyers for this area.

In reference to map17 and as proved in previous case study, Fear generally occurs in areas which have less occupancy rate, inaccessible, illegible or territorialized. And crime happened occurred in the same place which has the same urban form which created fear in mind of the locals.



Map 16



Map 17

VI. CONCLUSION

From the above study it can be concluded that fear is related to urban form and is related to crime, so crime is related urban form. Hence, a good urban design can help in preventing crime in a city.

Although study concluded with analysis of tangible parameters in relation with urban form but lacks in study and analysis on crime in cities , considering intangible factors of urban design like psychology, behavior pattern of criminal as discussed by C. Ray Jeffery in “Opportunities Theory” in 1970, “Behavioral model” in 1977 and An Interdisciplinary Approach in 1990 and under CPTED and Greg Saville & Gerry Cleveland in 1997 under 2nd Generation CPTED.

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