Spatial Perception Analysis of the Socio-Economic Effect of Urban Street Crime in the Residential Neighborhoods in Chittagong City, Bangladesh

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Abstract

Urban street crime (USC) has an immense effect on the residential neighborhoods (RN) and other sectors of urban life with a variation in the intra-city or intercity. The study explored the spatial perception variation of the socio-economic effects of USC in the RN in Chittagong City (CC), Bangladesh. Household-level questionnaire surveys, key informants interview, group discussion, and in-depth interviews were conducted for primary data collection. Besides, a GPS instrument was used for spatial data collection. Primary data were compared with official crime statistics. Literature was reviewed for the formulation of street crime and methodology development. Qualitative and quantitative techniques and SPSS software were used in data analysis. The study revealed that types of USC are huge, however, city dwellers frequently victims due to snatching, theft, political violence, and eve-teasing. The target of USC is higher in male people compare to women. The vital effect of USC in the RN is psychological, it creates mental panic, and therefore, people scared to move and young adult women hesitate to go outside their home to perform daily activities. In conclusion, further investigation is needed to determine the other causes and effects and solutions of USC for safe and sustainable city life.

Keywords: Chittagong City, effects of crime, residential neighborhood, spatial perception analysis, victim of street crime

1. Introduction

Spatial perception analysis (SPA) of the socio-economic effects of urban street crime (USC) on the residential neighborhood (RN), it is important to know who is committing a crime, who is being victimized, as well as when and where crimes are being committed. In this connection, several factors must be considered when discussing the distribution of USC and its' effects, especially, volume and types of crime as well as offenders' social characteristics (i.e., gender, age, race, ethnicity, and social class) (Brown, Esbensen, et al., 2012). Besides, SPA of USC can be employed in both an exploratory and as well as a more confirmatory manner with the primary purpose of identifying how a certain community or ecological factors (such as population characteristics or the built environment) influence the spatial patterns of crime (In this regard, Geographical Information System (GIS) increases the analytical value of the maps and crime mapping allows researchers and practitioners to explore street crime patterns (SCP), offender mobility, types of crime and victims, offenders' age and socio-economic status, causes of committing a crime and suitable time of committing a crime, hotspots of committing a crime, effects of street crime in the residential neighborhoods (RN) and serial offenses over time and space (Reid, Tita, et al., 2011).

Consequently, urban planners, local government authority as well as academicians are similarly trying their best how to bend the growth of crime to enhance the quality of urban life. United Nations (UN) in 2017 also calls on governments to achieve 2030 Sustainable Development Goals (SDGs), especially Goal 11 of the SDGs which is "Sustainable Cities and Communities" to make cities and human settlements inclusive, safe, resilient, and sustainable with recognizing the impact of rapid urbanization (United Nations, 2015; Uddin, 2018; Nath et al., 2018, 2020). Nowadays urbanization is called the engine of economic growth in any country or society (Spence, Annez, et al. (Eds.). 2008). Besides, cities all around the world are becoming more and more attractive to people from rural areas and abroad because of their financial power and economic opportunities, cultural wealth and places of interest (culture, tourism), job opportunities that offer a standard of living many people strive for, or simply for the lifestyle they promise and these cities offer numerous criminal opportunities to those who come looking for illegal activities. Hence, urbanization is the strongest predictor of crime and victimization too (Soomeren, 2013). It emerged that safety and security are very important issues not only because they affect one's mobility but also one's productivity and sometimes, even life. Crime and violence affect all members of society, regardless of sex, age, and income but are more evident in urban areas, especially poor and marginalized neighborhoods. It intrudes into homes, schools, commercial establishments, public transport, and sports, and other public venues (Rahman, 2013). In this regard, Haider (2015) found that residential neighborhoods have more advantages in committing crimes than any non-residential areas of the city due to escaping opportunity and local political patronization.

Along with the global scenario, in Bangladesh, urbanization and urban growth are one of the highest rates in the south Asian region (BIGD, 2014; Islam and Khan, 2012). For this research, Chittagong city (CC) has been selected as a study area. It is an ancient city dating around 2200 years old. Like Shanghai, Chittagong could be a city with two towns on the two sides of the Karnafuli River (Samad, Chisty, et al., 2016). With a population of more than 5 million, Chittagong is the second-largest city and financial capital of the country and it is one of the rapidly growing (BIGD, 2014) and most crime-prone regional cities in Bangladesh (Bangladesh Police, 2018). This research aimed to evaluate the perception of city dwellers on the current street crime level and its effects in the residential neighborhoods (RN) of Chittagong Metropolitan Police (CMP) areas. Hence, this research identified the major SCP in CC based on its' twelve (12) police administrative areas and examined the perception of city dwellers on offenders' age, who is the most victims, causes of committing a street crime (SC) and the best time of SC offending and the effects of SC in the CMPs' RN areas. This study used the census tract of the city because, previous research on urban crime (UC) in the developed and developing countries has used aggregate data at different neighborhood levels such as census, and block groups, or face blocks. Census tracts (CT) are recommended as the most appropriate research unit mainly because socioeconomic data are compiled for the explanation of various types of crime in their cities. An additional advantage of using CT is that it is large enough to capture an adequate number of criminal offenses during a given period (e.g. three or five or ten years) (Zhang & Peterson, 2007).

USC is a term for any criminal offense in a public place. i.e., vandalism, snatching, pick-pocketing, eve-teasing, sexual harassment, street robbery or hijacking, murder, a kidnapping, etc. that are usually committed to occur in outdoor, which have greater impacts in the society and these occur frequently in the urban streets at day and

night (Chowdhury, 2009). Nowadays, it is a vital issue to ensure the quality of urban life regarding the mobility of the city dwellers (Haider & Iamtrakul, 2018). Everyone is affected by crime, either as a direct victim or a friend or family member of a victim. Even individuals who are not direct victims of crime can be negatively affected in a variety of ways, such as developing an increased fear of crime or experiencing the financial impact of crime (e.g., higher insurance rates, lost workdays). Another group affected by crime is first responders—the people who typically are first on the scene or first to respond to crime (Wasserman & Ellis, 2008). In defining victim of crime, the UNO (1985) mentioned that a victim as a person who has suffered physical or psychological damage, economic loss, or a noticeable deterioration of fundamental rights through actions or negligence contrary to a nation's criminal legislation (Lindgren & Nikolic-Ristanovic, 2011).

In this connection, Glaeser & Sacerdote (1999) cited that cities may alter their residents in a way that makes them more prone to crime. Attributes of cities may alter people's investment in human capital or in tastes (such as patience) that are related to crime. Social interactions and neighborhood effects are more important in dense urban areas, and these forces may alter preferences. Kitchen (2006) also said that there is a moderate geographic relationship between USC and socio-economic status in the city, with 40% of socially disadvantaged areas also being high crime areas (HCAs). When specific areas were examined more closely, several important characteristics did emerge from the study. For example, HCAs were found to have above-average levels of low-income, single people, and rented dwellings. Hence, the relationship between neighborhood socioeconomic disadvantage areas and adolescent offending influence on the RN due to 1) neighborhoods are rarely spatially independent of each other, and 2) adolescents spend an appreciable portion of their time engaged in activities outside of their immediate neighborhood (Vogel & South, 2016). Therefore, characteristics of neighborhoods outside of, but geographically proximate to, RN may affect adolescents' propensity to engage in delinquent behavior. Through multiple channels, USC and violence threaten the welfare of city dwellers'. Beyond the direct effect on victims, crime, and violence inflict widespread costs, generating a climate of fear for all citizens and diminishing economic growth (UNODC & The World Bank, 2007).

Nowadays planners and academicians admit that after physiological needs like food, shelter, and health, the next important human need is safety. If it does not fulfill, it can hinder humans from progress toward more elevated needs (Yazdanfar and Nazari, 2015). Research and evaluations have provided examples of situations where consideration of physical design or redesign appears to have contributed substantially to lowering crimes or to crime-related public order problems: specifically (i) Designing safer public housing, (ii) Erecting barriers and changing street patterns, (iii) Controlling access to buildings, schools, parks, public housing, or other trouble spots through the use of regulated entry, and (iv) Creating safer public places(Taylor & Harrell, 1996). For this situation, Salehi (2010) advocated for urban environment planning (UEP). He mentioned that UEP can prevent abnormal behaviors, crime, and a felony in urban streets by identifying effective local features and environmental conditions, along with other actions, so that the felon would have much fewer opportunities for committing criminal and unlawful acts in urban areas. USC needs to be taken into account during the planning process, as valuable components can be provided that can offer effective approaches to street crime prevention and the improvement of community safety (Santana, Santos, et al., 2009). Hence, this study attempted to identify the several types of effects of USC on the RN of CC and measuring the spatial variability through the urban dwellers' perception study.

2. Materials and Methods

2.1. Study Area

The Geographical extension of Chittagong Metropolitan Police (CMP) study area in between 22° 9' 31.39" to 22° 27' 59.54" North Latitude and 91° 44' 5.59" to 91° 53' 33.02" East Longitude (Figure 1). The weather of Chittagong mostly characterized by tropical monsoon climate and the average temperatures are observed high in nature. The warmest and coldest months are April and January with an average maximum temperature of 31°c and 28°c, respectively. The seasons are varied and marked with the dry and cool season is from November to March, pre-monsoon season is from April to May (very hot), and sunny and monsoon season is from June and October (warm, cloudy and wet). The rainy seasons are intermixed at present, falls in the months from April to October (Weather and Climate, 2019).

The CMP is the top law enforcement agency in Chittagong, Bangladesh; which established in 1978 under the CMP Ordinance Act, established by the Government of Bangladesh (The Chittagong Metropolitan Police Ordinance, 1978). Under the CMP corridor, there are 16 police stations (PS) currently operating (CMP, 2013). The present research was conducted in twelve (12) PS (local Name-Thana) in CMP areas out of 16 PS. Due to newly formed additional four (4) PS; relevant data were not shown separately in this research because of the unavailability of GIS shapefiles with updated information. Hence, the new sixteen Thana base map as well as the statistical data gap, exist on these four newly created PS.

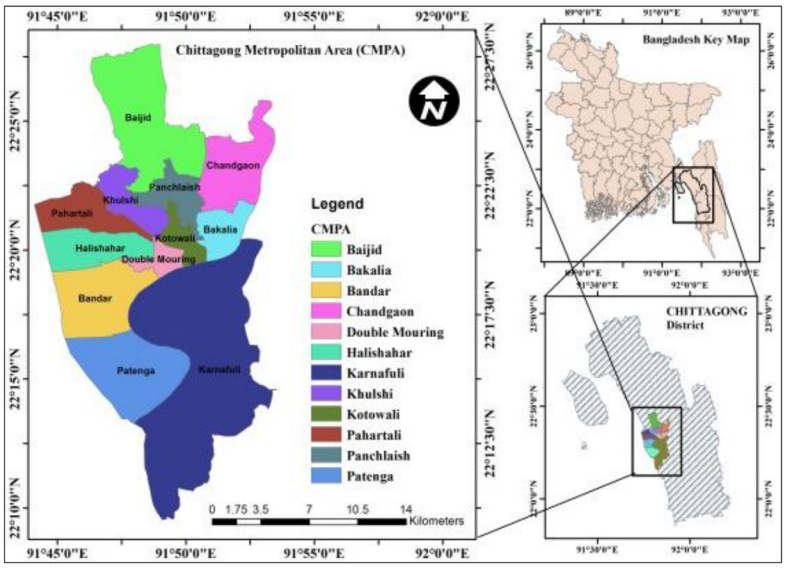


Figure1. Location of the study area

2.2 Methods

This study included two types of research. It was descriptive and exploratory research using primary data gathering during January 2018 to December 2018 from four hundred and twenty-four (424) (Guthrie, 2010) household head questionnaire survey (HHHQS), sixty (60) key informants interview (KII) (local elite person, crime reporters, religious institution head, neighborhood organization's head, social institution head, political leader, researchers, lawyers, housing society leader, business community leaders, etc.), and fifteen (15) group discussions (GD) at the twelve (12) police stations of CMP. Along with these, after analyzing the HHHQS, KII, and GD data, an in-depth interview was conducted at one hundred and twenty-six (126) most crime-prone location in CMP areas well as forty (40) police officers gave an in-depth interview from all police stations and ten (10) urban planners also provided an in-depth interview from Chittagong Development Authority (CDA, city planning authority) during January 2019 to August 2019 correspondingly.

It is descriptive research because it described the current PS based crime volume, crime types, crime patterns, trends, and characteristics of crimes in CC based on secondary data analysis.

Furthermore, it is explanatory research because it identified the major SCP in CC and examined the offenders' age, who is the most victims, causes of committing an SC and most prone time of SC occurrence, and the effects of SC in the CMPs' RN areas.

This research was a mixed-method strategy that combines qualitative and quantitative studies. Both strategies were used at the same time and priority was given to qualitative studies. Moreover, the quantitative study was also needed to complement the qualitative one. From the primary survey, qualitative data converted into quantitative information for statistical analysis.

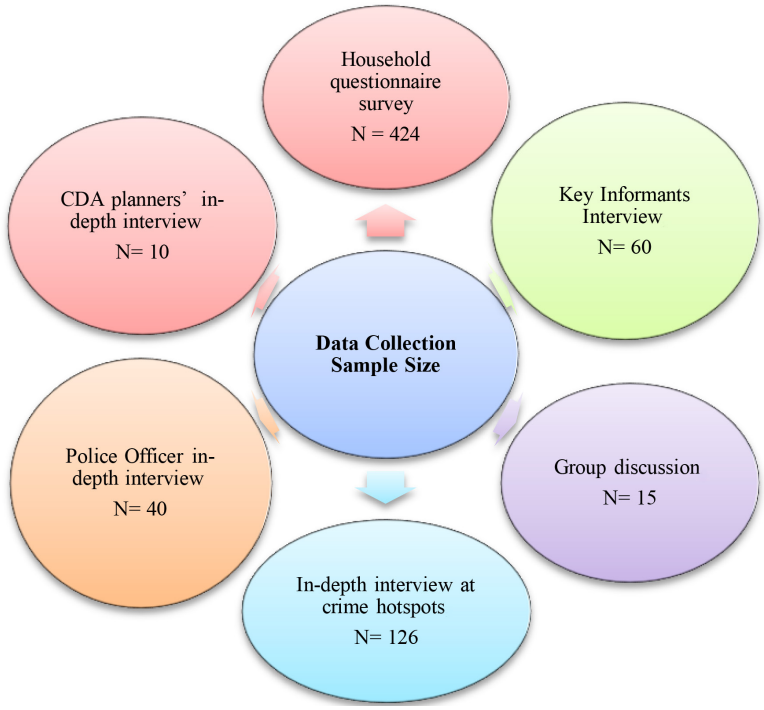


Figure 2. Data collection sample size.

2.2.1 Sample Size

According to the household size and population number in CC, it was followed by the statistical method of sample size determination as shown in Figure 2.

2.2.2 Social Scaling and Weighted Average Index (WAI)

The social scaling technique (Bhattacherjee, pp. 48-49, 2012) was used to assess the intensity of street crime level, effects level of crime hotspots on an RN, etc. The WAI was applied to various types of social scaling techniques (Miah, 2016)). In the primary data collection, respondents' were requested to make a rank based on their perception regarding the selected variable. The WAI and normalization of the data were calculated based on the equation (1) adopted from Miah (2016).

$$WAI = \{1^{st}\ \text{rank}\ (1.0) + 2^{nd}\ \text{rank}\ (0.8) + 3^{rd}\ \text{rank}\ (0.6) + 4^{th}\ \text{rank}\ (0.4) + 5^{th}\ \text{rank}\ (0.2)\} / \sum \text{ith rank} \quad \text{(Eq. 1)}$$

Where, WAI are represent, WAI = Weighted Average Index; 1.0 = weight for the 1st rank; 0.8 = weight for the 2nd rank; 0.6 = weight for the 3rd rank; 0.4 = weight for the 4th rank; 0.2 = weight for the 5th rank;

2.2.3. Data Analysis

The data and the information used in the present study were analyzed by applying various qualitative and quantitative techniques which are very much common and acceptable in scientific research. A global positioning system (GPS) was used to determine the police station locations, household respondents, key informants, group discussants (GD), in-depth interviewees' (police officer, a resident of the street crime-prone location, town planners,), etc.

In this study, more specifically, descriptive, analytic, explanatory, univariate, bivariate, multivariate, and spatial analytical techniques of GIS such as natural breaks (Jenks) classification (5 classes) method were applied in analyzing data. In this section, the major data analytical techniques of this research are sequentially presented.

Qualitative techniques were used to examine the current research. This analysis technique helped to understand the magnitude of SC occurrence, the offenders' age, who is the most victims of SC, the causes of committing an SC, and the most prone time of SC occurrence as well as the effects of SC in the RN of CMP. The specific techniques were used to analyze the qualitative information and data such as qualitative statements and descriptions.

Statistical Package for the Social Sciences (IBM SPSS, Version 25) the software was used for numerical data processing and analysis. In this regard, both descriptive and analytical statistical techniques were applied to analyze the data.

Descriptive statistics were applied to explain frequency, percentage (%), cross-tabulation, at least two variables, or more with the response and multiple responses of the respondents'. The comparison of the level of frequency and percentage (%) was used as a tool to interpret the data showing on the crosstab.

Multivariate analyses were applied to get the scientifically acceptable result from this study. Analysis of Variance (ANOVA) was conducted to evaluate the relationship between SC effects in the RN and socio-economic characteristics in the city.

GIS techniques were used to show the various variables regarding USC and variation zones in the maps in considering different PS' administrative areas. In this aspect, ArcGIS 10.7 software was used for displaying the spatial variations of different variables of this study. At the final outset, the detailed methodological workflow is presented in Figure 3.

3. Results and Discussion

3.1. Duration of Living

The duration of living in a residence is very important to evaluate any socio-economic issues as well as the SC level and its' causes and effects in an RN. In this study, the results suggest that the average duration of the current residence of the respondents' was more than 10 years and in CC, it was more than 15 years. Moreover, the overall peoples' perception regarding the duration of living at a current residence in CC is highlighted in Figure 4.

3.2 Perception of SC Level

In calculating the level of SC occurrence in the RN areas of CMPA, five scale factors were used in taking the judgments of the respondents. The scale of opinion types of the SC level in the RN was - very high (every day occurs), high (at least one occurrence in a week), moderate (at least one occurrence within the last month), low (at least one occurrence within the last three months),

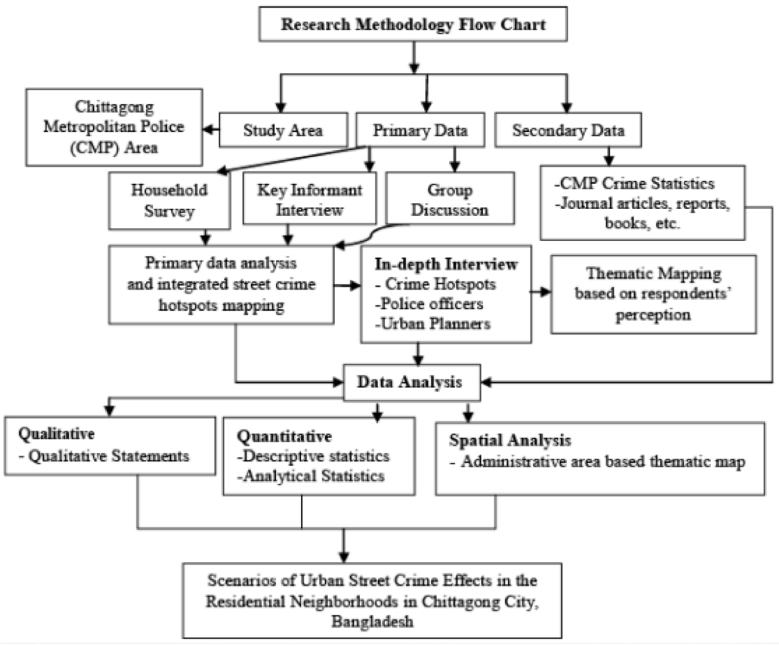


Figure 3. The methodology of the present study.

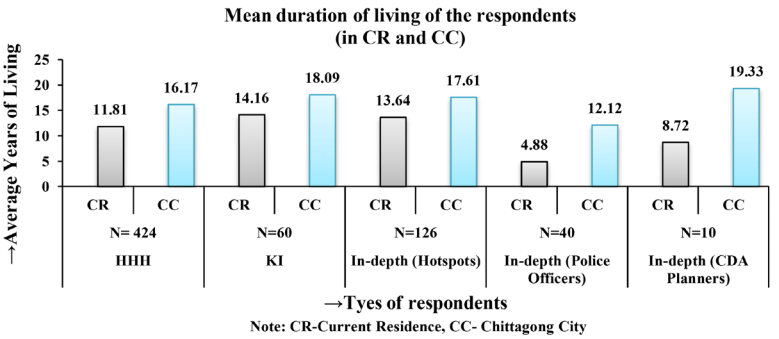


Figure 4. Mean duration of living of the respondents.

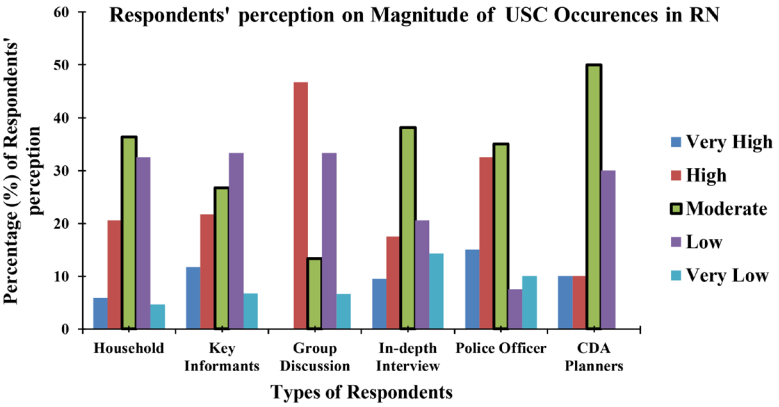


Figure 5. USC Level in RN Area.

and very low (at least one occurrence within the last one year). The detailed primary sources of collected data regarding respondents' perceptions are shown in Figure 5.

Among all PS respondents' perceptions, the ANOVA test was performed for different groups (such as HH, KI, In-depth interview at the hotspot, and police officers). The results showed that HH and in-depth interviews at hotspots were highly significant variation (.001 and .000 at a 5% level of significance). On the other hand, the rest of the ANOVA test results of KI and police officers were not found significant variation (0.105 and 0.183). It is worth mention that, among all the groups of respondents in the group discussion, it was found a high level of SC in the urban RN (URN). However, the majority of the respondents mentioned a moderate level of SC occurrence in URN.

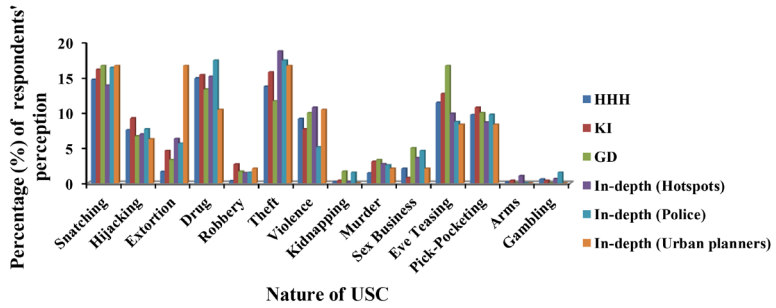


Figure 6. Nature of USC in CMPA

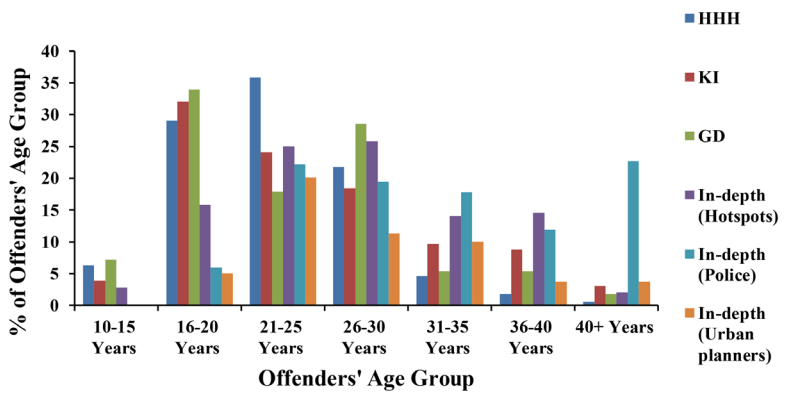


Figure 7. Perception of the offenders' age group.

3.3. Types of Major USC

In urban society, there might have many types of crime occurrences in day and night. Seasons also play an important role in the pattern of crime variation. As a whole, in Bangladesh financial scams, property crime (household theft, snatching, hijacking, vehicle thefts), and petty drug crimes comprise the majority of criminal activity in major cities. Homicides, sexual assaults, personal robberies, hijacking, snatching, and residential break-ins occur with regular frequency. Violent crime tends to be situational with the perpetrators having some level of familiarity with the victims as opposed to random violent criminal acts. Many news stories reporting violent crimes indicate circumstances under which potential victims may have had an opportunity ahead of time to alter patterns of behavior and respond to environmental factors, which placed them at risk. In this background, at the very beginning, it was explained to the respondent to mention the top five crime occurrence name sequentially that usually occur in their residential areas and they stated the topmost one at first and fifth one at last. Based on their judgments, Figure 6 reveals the types of USC in RN areas in CMP. Along with this, Table 1 shows the PS based major crime records in CMP areas during 2001-2017 although in some types of USC are not showing in the Table due to victims unwilling to report to the PS considering the time consuming, money expenditure for judiciary process, political pressure, etc.

3.4 Offenders' age

In the criminological study, it was found that there is a strong relationship between age and criminal activity. The proportion of the population involved in crime tends to peak in adolescence or early adulthood and then decline with age (Ulmer & Steffensmeier, 2014). This research carried the issue in mind and Figure 7 demonstrates the current research findings of the offender's age. Committing the USC in CC proved that adolescence and adulthood population (16 to 30 years) are more prone to criminal activity.

Table 1. Police Station Based Major Crime Records in CMP Areas during 2001-2017

Name of PS	Robbery	%	Hijacking	%	Murder	%	Abduction / Kidnapping	%	Theft	%	Illegal arms dealing	%	Illegal drugs dealing	%	Women & child oppression	%	Extortion	%
Patenga	13	4.68	20	1.62	86	6.15	40	4.85	336	5.38	48	2.69	1532	6.31	282	6.22	1	0.61
Bandar	11	3.96	133	10.78	145	10.37	47	5.70	813	13.02	74	4.15	1327	5.46	386	8.51	13	7.88
Double Mouring	18	6.47	111	9.00	134	9.59	87	10.56	740	11.85	161	9.02	2451	10.09	443	9.76	4	2.42
Halishahar	16	5.76	58	4.70	85	6.08	37	4.49	302	4.84	74	4.15	1233	5.08	300	6.61	4	2.42
Pahartali	25	8.99	83	6.73	113	8.08	59	7.16	311	4.98	200	11.21	2609	10.74	347	7.65	95	57.58
Kotowali	34	12.23	352	28.53	223	15.95	149	18.08	1320	21.13	427	23.93	4943	20.35	597	13.16	24	14.55
Khulshi	48	17.27	114	9.24	115	8.23	49	5.95	537	8.60	117	6.56	1594	6.56	523	11.53	1	0.61
Panchlaish	41	14.75	142	11.51	84	6.01	110	13.35	654	10.47	190	10.65	1096	4.51	317	6.99	3	1.82
Bakalia	8	2.88	75	6.08	87	6.22	46	5.58	235	3.76	115	6.45	2466	10.15	419	9.24	0	0.00
Chandgaon	25	8.99	81	6.56	120	8.58	76	9.22	424	6.79	145	8.13	1941	7.99	366	8.07	0	0.00
Baijid	22	7.91	51	4.13	143	10.23	78	9.47	346	5.54	186	10.43	2180	8.97	425	9.37	2	1.21
Karnafuli	17	6.12	14	1.13	63	4.51	46	5.58	228	3.65	47	2.63	877	3.61	132	2.91	18	10.91
Total	278	100.00	1234	100.00	1398	100.00	824	100.00	6246	100.00	1784	100.00	24294	100.00	4537	100.00	165	100.00
Rank	8		6		5		7		2		4		1		3		9	

Source: Chittagong Metropolitan Police (CMP), 2014& 2018, Chittagong.

3.5 Offender Causes of Committing Crime

Criminologists and urban social academics opined that crime is primarily the outcome of multiple adverse social, economic, cultural, and family conditions. Besides, those who commit USC are not isolated from the societies, and they know what it means to be an offender, both in the virtual sense of an ascribed identity as well as in the more immediate, situated sense of enacted selfhood. In these points of view, the current study conducted in Bangladesh in such a city where rural areas people are poorer compare to urban. Hence, rural people come to the urban centers to have their livelihoods as we know urban areas have more opportunities for employment as well as criminal activities. Figure 8 shows the causes of committing USC in CC.

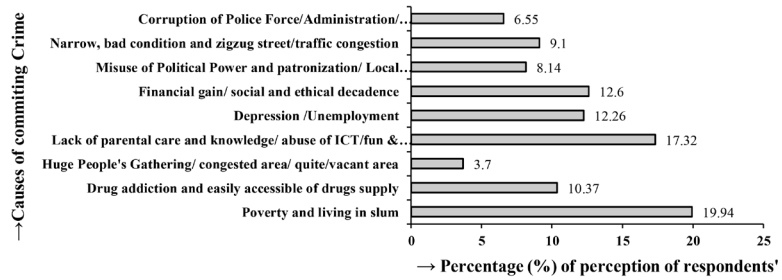


Figure 8. Perception of causes of committing the crime.

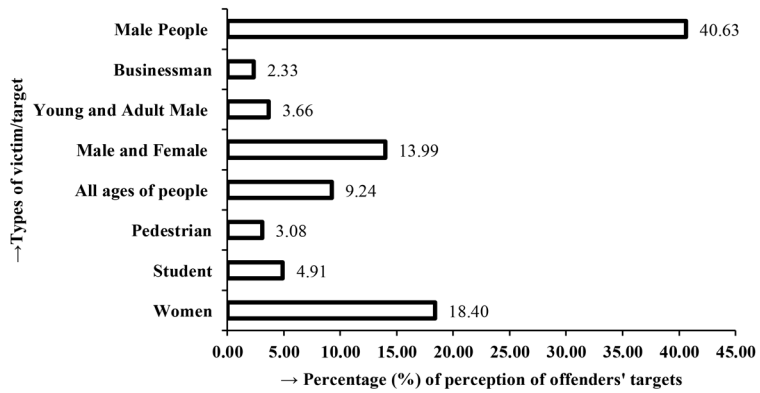


Figure 9. Perception of offenders' target/victim of USC.

The main causes of committing or engaging USC are poverty and then lack of parental care, financial gain, and political patronization are two other important causes of offending USC in CC. Unemployment and drug addiction also play a vital role. Along with these, urban street conditions (narrowness, broken condition, zigzag pattern, and huge traffic jam) favor the offenders in committing USC.

3.6 Offenders' target/ victim of USC

There is very often a connection between victims of crime and criminal offenders. The relationship between crime victimization and criminal offending can be somewhat elusive. Research findings present that offenders are 1.5 to 7 times more likely than non-offenders to be victims of crime, while victims are 2 to 7 times more likely than non-victims to be criminal offenders (Hannis, 2015).

Except for children and old people, more or less everyone is the target of the offender in the USC in RN in CC. Because of the formation of urban societal characteristics of Bangladesh and male people is the main earning member in the family and financial involvement is much higher than women. As a result, male people are the most obvious target of the offender in the urban street. In the case of women who are usually going outdoors for shopping or workplace or accompanying their kids to the schools and colleges are the targets of offenders. Man and woman both are the main target of the offenders in the urban streets, as well as the regular school and college-going students. Moreover, young people as well as pedestrians and businessmen who are frequently moving in the urban streets for their daily activities also victims of USC.

3.7 Effects of USC on RNA

Residents of the neighborhoods have negative perceptions living in crime-prone areas and the crime rate has a negative impact on property values. The present research findings suggest that USC affects residents and the entire neighborhood. The correlation between neighborhood environmental factors (e.g., poverty, percentage of single-parent households, population mobility) and juvenile delinquency, positing that neighborhood attributes influenced crime through their impact on the community-level disorder, residential cohesion, and informal social control. Poverty and family disruption, for example, make it difficult for residents to establish common values and engage in relationships of mutual trust that establish neighborhood social control (MacDonald, et al. 2009).

The present study reveals that several types of effects occur in RN due to USC in CC. Broadly, the effects of categorizes are psychological, social, and economic. In comparing among three broad categorical effects, psychological effects are much higher and it creates mental panic, victims of physical assault or harassment, scared to travel alone, or keep cash among the city dwellers and young adult women going outside their home. Besides, considering the social effects, it is huge in number such as create a bad image of the area to others, increase social crime (pick-pocketing, theft, robbery, etc.), infectious to young adult, increase drug addiction, moral decadency/ indiscipline environment, decrease the security of the location and people avoid this area, etc. The financial effects of USC in CC varied significantly. Types of economic effects due to USC are giving illegal toll, land value decrease, renter leave, economic loss, etc. The types of USC effects in the RN areas in CC are demonstrated in Figure 10.

The study revealed that the effects of USC in the RN of CC were unevenly distributed. Observation and as a resident of the city, the main factors of the uneven distribution of the effects of USC in the RN of CC are socio-economic characteristics of the city population, USP, and urban local management which included urban local government- Chittagong City Corporation, (CCC), law enforcement agencies, and Chittagong Metropolitan Police(CMP). Figure 11a and Figure 11b demonstrates the perception of city dwellers regarding USC effects in the RNA. It was based on a weighted average indexed (WAI) and it indicates that the effects of USC in the RNA in CMP areas unevenly distributed. Highly dense population, unplanned urbanization, and economic opportunities have significant effects on USC in CMP areas.

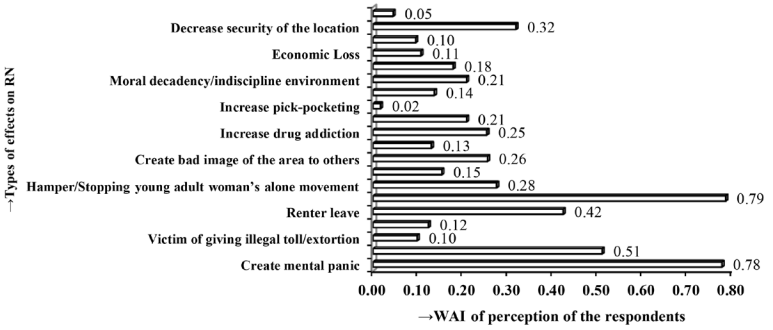


Figure 10. Types of USC effects in the RN in CC.

The respondents' perception-based USC effects in the RN in CMPA and the spatial distribution of recorded crime at different CMP Stations from 2001-2017 are shown in Figure 12a, Figure 12b).

Besides, the spatial distribution of the individual variable of major types of USC effects in the RN in CMP areas was shown in Figure13a-k. Each figure demonstrates that the effects were not evenly distributed and the causes of uneven distribution of poverty, unemployment, inefficient urban management system, and political and other causes which are already mentioned

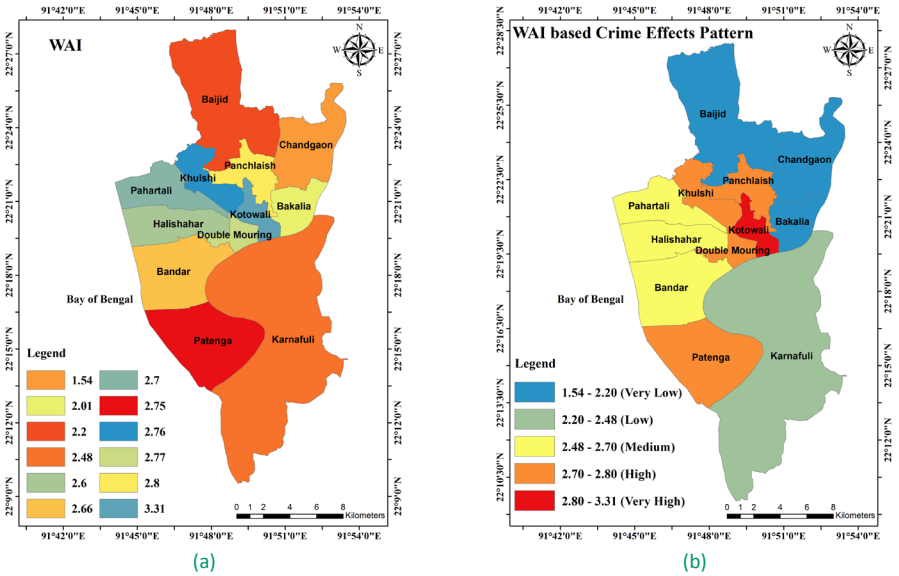
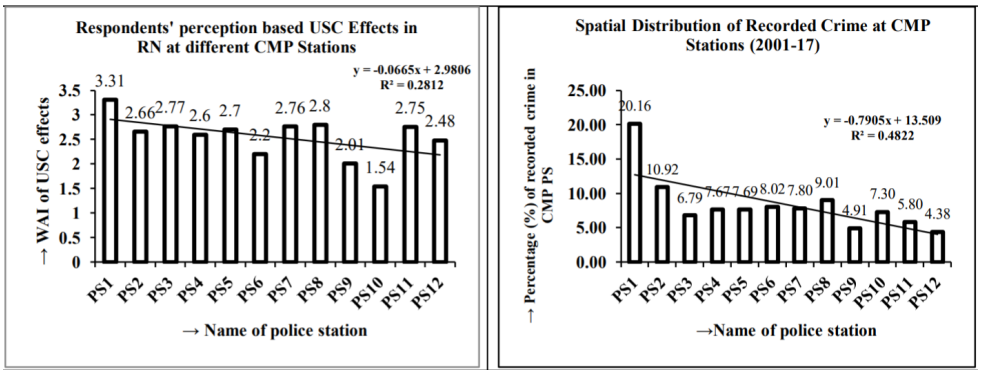


Figure 11. Effects of USC and WAI based Crime effects pattern analysis in the RN in CMP areas; (a) Effects of USC; (b) WAI based Crime Effects Pattern (Natural breaks- Jenks method).



Source: Field survey 2018-2019

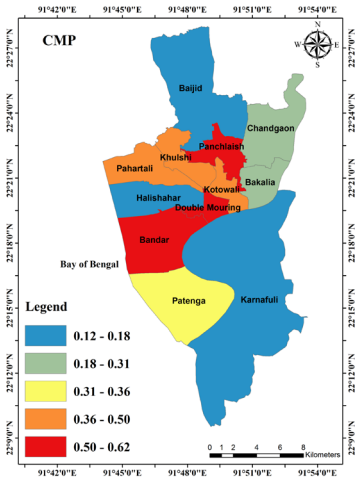
Source: CMP, 2014& 2018

Figure 12. Respondents' perception based USC Effects in RN and Spatial distribution of recorded crime at different CMP stations; (a) Perception-based USC effects in RN, (b) Recorded crime at CMP stations from 2001-2017.

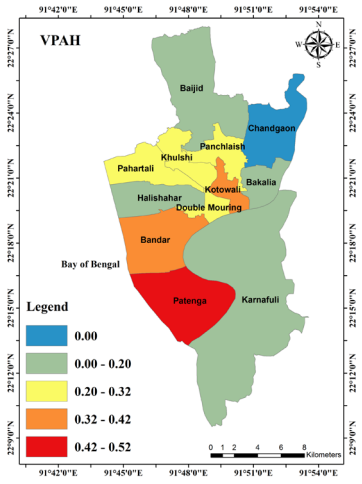
Note: PS-Police Station, PS1- Kotowali, PS2- Double Mooring, PS3- Panchlaish, PS4- Bakalia, PS5- Chandgaon, PS6- Baijid, PS7- Khulshi, PS8- Pahartali, PS9- Halishahar, PS10- Bandar, PS11- Patenga, and PS12- Karnafuli.

in section 3.5.

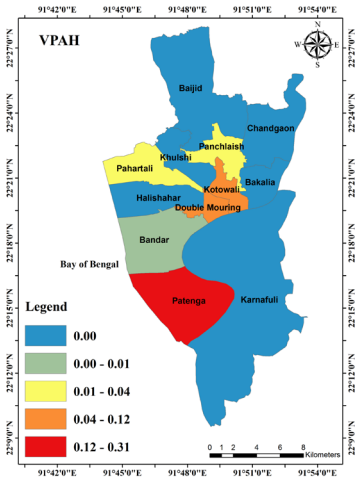
Furthermore, the analysis of variance results also shows the significant variation regarding the effects of USC in the RN in CMP areas. Respondents were requested to identify the five most effects of USC on the RN based on their daily life experiences and made the rank according to the severity of the effect. In this background 'One-way ANOVA' tests were performed to understand the level of the variation of their judgments. Table 2 indicates that household respondents, in-depth interview in the crime hotspots, and key informant interviews, all three respondents' perceptions together demonstrate a



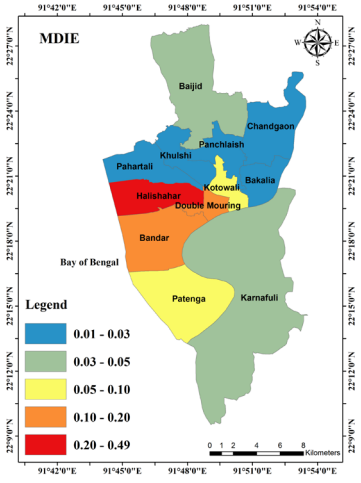
a. Create Mental Panic (CMP)



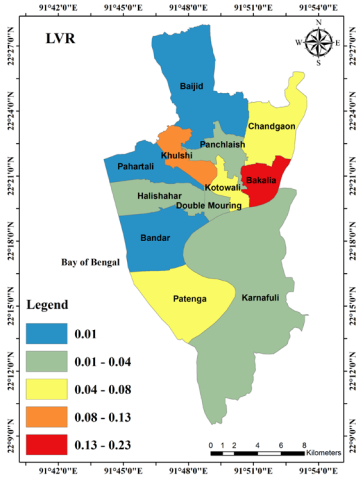
b. Victim of physical assault and harassment (VPAH)



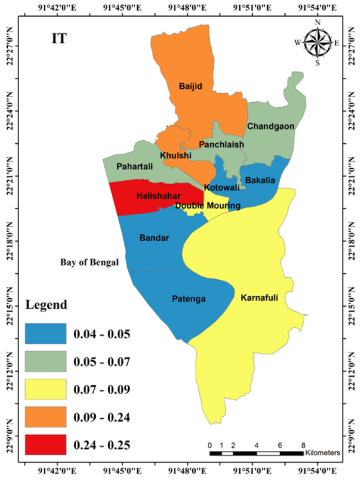
c. Victim of giving an illegal toll



d. Moral decadency/indiscipline environment

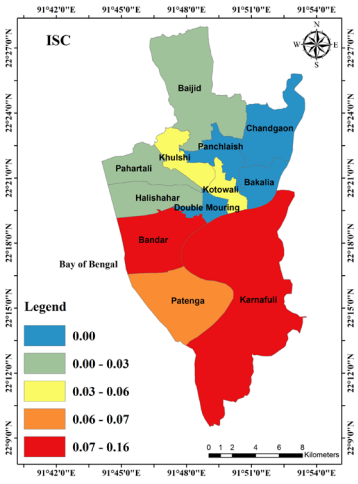


e. Land value reduce

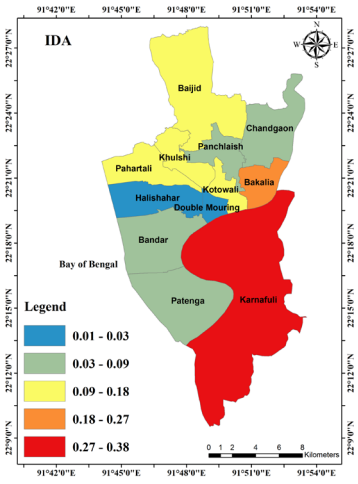


f. Increase theft

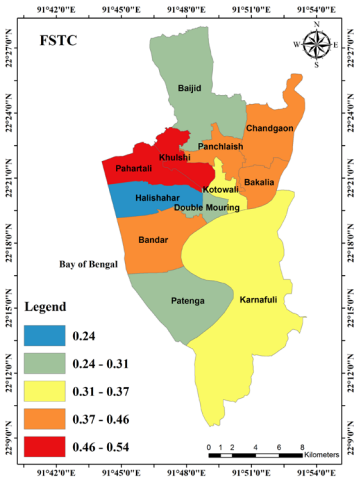
Figure 13. The Spatial distribution of the Individual variable of Major Types of USE Effects in the RN in CMP areas



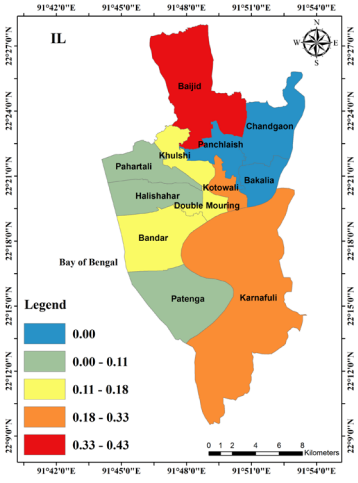
g. Increase social crime



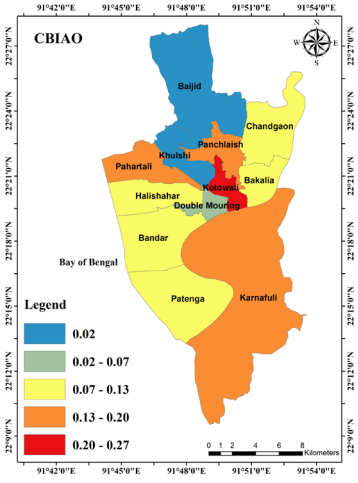
h. Increase drug addiction



i. Feel Scared to take Cash



j. Insecurity of the location



k. Create a bad image of the area to others

Figure 13. The Spatial distribution of the Individual variable of Major Types of USE Effects in the RN in CMP areas (continue)

Table 2. One-way ANOVA Test Results of Household Respondents, In-depth Interview (Hotspots) and Key Informants Interview

Household Respondents							In-depth Interview (Hotspots)					Key Informants Interview				
Effects of Urban Street Crime		Sum of Squares	df	Mean Square	F	Sig.	Sum of Squares	df	Mean Square	F	Sig.	Sum of Squares	df	Mean Square	F	Sig.
Rank1	Between Groups	797.91	11.00	72.54	4.89	0.00	319.29	11.00	29.03	1.84	0.06	207.25	11.00	18.84	1.53	0.15
	Within Groups	6114.08	412.00	14.84			1801.92	114.00	15.81			590.94	48.00	12.31		
	Total	6912.00	423.00				2121.21	125.00				798.18	59.00			
Rank2	Between Groups	646.75	11.00	58.80	4.25	0.00	443.57	11.00	40.33	2.60	0.01	299.34	11.00	27.21	2.59	0.01
	Within Groups	5705.12	412.00	13.85			1768.76	114.00	15.52			504.84	48.00	10.52		
	Total	6351.87	423.00				2212.33	125.00				804.18	59.00			
Rank3	Between Groups	225.10	11.00	20.46	1.87	0.04	392.63	11.00	35.69	2.91	0.00	114.35	11.00	10.40	0.83	0.61
	Within Groups	4513.04	412.00	10.95			1400.23	114.00	12.28			600.63	48.00	12.51		
	Total	4738.15	423.00				1792.86	125.00				714.98	59.00			
Rank4	Between Groups	340.01	11.00	30.91	2.19	0.01	541.86	11.00	49.26	2.99	0.00	121.61	11.00	11.06	1.00	0.46
	Within Groups	5817.53	412.00	14.12			1878.18	114.00	16.48			529.99	48.00	11.04		
	Total	6157.54	423.00				2420.04	125.00				651.60	59.00			
Rank5	Between Groups	683.55	11.00	62.14	4.11	0.00	548.34	11.00	49.85	2.49	0.01	621.09	11.00	56.46	3.89	0.00
	Within Groups	6235.36	412.00	15.13			2282.88	114.00	20.03			697.65	48.00	14.53		
	Total	6918.91	423.00				2831.21	125.00				1318.73	59.00			

significant spatial variation of USC effects on the residential neighborhoods in CMPA.

4. Conclusion

Urbanization and USC is a simultaneous event and USC deteriorates the quality of urban life. The effects of USC vary from city to city and country to country or even within a city. Due to the diversified socio-economic formation and economic activities in the RN of a city, the effects of USC depend on the residential formation of the city dwellers. The present study exposed that magnitude of USC in CC is moderate but has a significant spatial variation. Types of USC are also huge, however, city residents frequently a victim of snatching, theft, political violence, and eve-teasing. To support this, offenders' ages in the study ideally helpful to proven criminological parenthesis but the causes of committing a crime are much diversified. Major causes of offending crime were poverty, unemployment, and lack of parental care, illiteracy, drug addiction, and political patronization. The target or victim of USC is male people compare to women. The vital effects of USC in the RN are psychological, it creates mental panic, and people scared to move and young adult women hesitate to go outside their home to perform their daily activities. In this circumstance of the current research results, initiatives are needed for poverty alleviation and slum improvement, implementation of urban planning, and efficient urban management in CC to improve the quality of urban life. Besides, more research is urgent to disclose any other effect in the RN of CC and further directed to solve these effects or reduce for a safe, resilient, and sustainable urban life.

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