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Full Length Research Paper

Urbanization, emerging slums and increasing health problems: a challenge before the nation: an empirical study with reference to state of uttar pradesh in India

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Urbanization in developing world is unprecedented, and in coming few years the number of urban dwellers is expected to exceed rural dwellers. In India, due to unprecedented and unplanned urbanization the slum areas in urban society are rapidly increasing posing serious threat to sustainable development of the country. The objective of the present study is to map out major slum areas of an urban centre, the environmental conditions in and around of those slum areas and the impact of environmental condition on health profile of the dwellers. The analysis is based on primary data collected at two points of time i.e. November-December 2001; May-June 2009 with the help of a questionnaire through a comprehensive survey of ten major slum areas of Aligarh city, India. The analysis reveals that these areas are characterized by complete absence of basic amenities and facilities like drinking water, toilets and bathroom, drainage system and garbage disposal facilities, and no improvement has been observed over the period of seven years. Various infectious non-communicable and communicable diseases especially respiratory infections (60.22%), tuberculosis (31.26%) and diarhoea/dysentery (54.23%) were observed to be very common health problems that showed positive relationship with the use of traditional fuels (p<0.01), poor personal hygiene (p<0.01) and contaminated drinking water (p<0.01) respectively. The paper concludes with policy-oriented discussion of the relationship between urbanization, increasing number of slums and health challenges before the developing nations.

Key words: Aligarh, City, Urbanization, Slum, Facilities, Amenities, Health

INTRODUCTION

Urbanization, a process of city establishment and growth, is fast becoming the defining process in shaping the course of demographic, economic and social transformation of a nation. The process has been underway for more than 250 years ago but has become a global salient feature only in 21st century especially with its prime locus in the poorer parts of Asia and Africa (UN Habitat 2007). By the end of the year 2008, for the first time in history, humanity officially crossed the line from being a rural to an urban species. It is estimated that in the coming few years more of us will live in urban areas than in countryside as the urban population is projected to increase 4.9 billion by 2030, i.e. roughly 60 per cent of the total world's population (UN 2007). During this time period approximately 190, 000 people will be added to cities around the world daily. For every 5-6 people added to developed world countries, 100 will be added to the cities of the developing world with the average annual growth rate of 0.49 per cent and 2.27 per cent respectively.

The growth of urban centres in developing countries has been accompanied by high pace of social and economic development resulting into the phenomenal increase in city and town population. With the growth of cities, the cost of housing and infrastructure is increasing on the one hand, and lack of affordable housing facility on the other hand often forced the urban poor to rely on or create their own informal infrastructure, giving way to dramatic growth of slums in urban centres. According to an estimate (UN-Habitat 2006), nearly 327 million people

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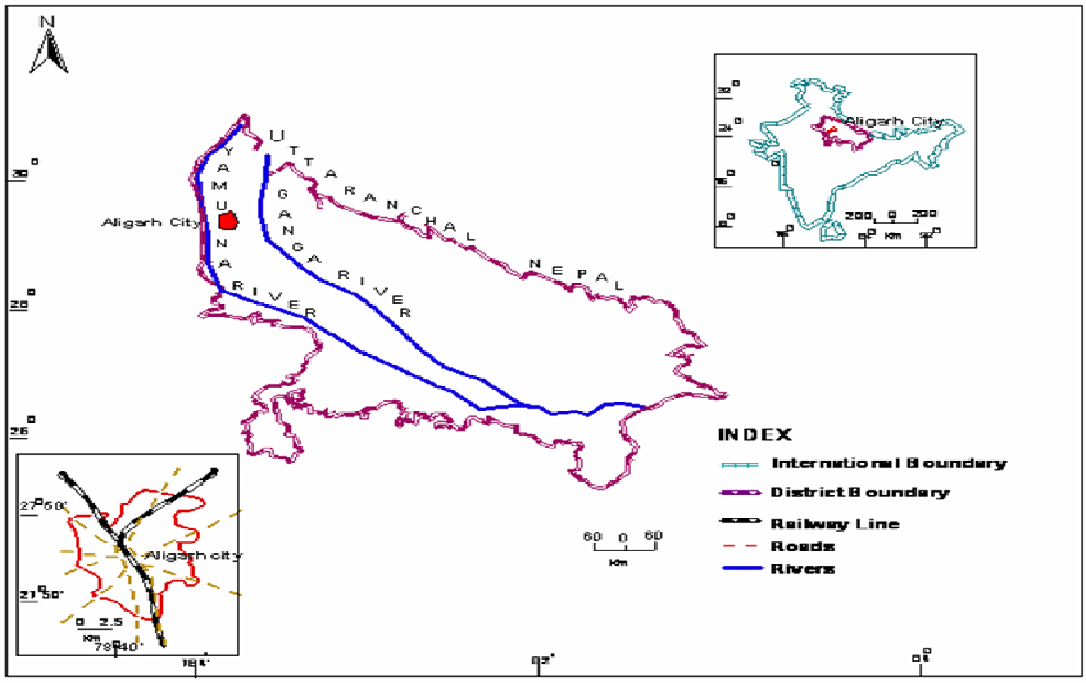

Figure1. Location of Aligarh

live in slums in Commonwealth countries and almost one in every sixth citizens. In a quarter of Commonwealth countries (11 African, 2 Asian and 1 Pacific), more than two out of three urban dwellers live in slums (Comhabitat 2006). It is projected that by 2030, close to 1.7 billion of the expected 3.93 billion urban dwellers in low-income and middle income countries will be living in slums (UN millennium development project 2005). As the slums mainly occupy environmental sensitive sites such as sites near solid waste dumps, along the transportation lines and next to open drains and sewers pose major threat to the well being of urban population and sustainable development of urban centre.

The situation of India is not different from the rest of the world. The higher economic vitality of cities, and the possibilities of employment compared with the countryside pull the people to come and stay resulting into mushrooming of slums in urban centres. An analysis of population growth trends between 1991 and 2001 shows that while India grew at an average annual growth rate of 2 per cent, urban India grew at 3 per cent, mega cities at 4 per cent and slum populations rose by 5 per cent (Chatterjee 2002). Despite being the characteristic feature of each and every city, the slums are the 'dumping ground' for unwanted aspects of urban life and the recipients of the city's externalities; noxious industry, waste materials, crime, social dysfunction, and fragile, dangerous or polluted environment. However, out of unhealthy, crowded and often dangerous environment emerge serious health risks, normally associated with poor sanitation, lack of waste disposal facilities, presence of vermin, and poor water quality (EHP 2003; WHO 2004). Apart from it, inadequate nutritional intake due to non-availability of subsidized ration or availability of poor quality ration, inability to access basic services and lack of education makes slum dwellers prone to large number of infections diseases (Riley and Ko et al 2007). The vulnerability of the slum dwellers is also increases as they are not well aware about the magnitude, distribution, and risk factors for the illnesses before they manifest as major health problems. Continued neglect of the health conditions of this ever increasing section of the modern urban society could inevitably lead to over expenditure of government in the management of health sector that could in turn lead to economically and socially disastrous consequences for nations with large urban slum population. In order to measurably improve global health outcomes, especially in developing countries, the prime requisite to develop new approaches and models for assessment of the health determinants of this rapidly expanding section of the urban society.

Many scholars and social scientists have studied the problem of slums in big cities or metropolitan cities but information on environmental condition of slums with reference to health outcomes of medium and small town is sparse. That is why, the present study is carried out in Aligarh city which is a Class I city (Greater than 1,00,000 population) with 0.6 million population (2001) of North India. It is located at 27˚4´ east longitude and 27˚53´ north latitude (Figure1). The city covers an area of 34.98

Variables	Explanation
Sex	male/female
Migrated	yes (Name of the state and reason of migration)/no
Family Size	>4, 4-8, 9-12, <12
Education Level	below Xth, X, above Xth, uneducated
Profession	daily wager/rickshaw puller/business/maid/servant
Housing material	thatched, polythened, mixed
Bathroom and sanitation condition	use of latrine/open defecation
Drainage system around the dwelling	open/closed
Garbage around the dwelling	spread everywhere/not spread
Cooking fuel	traditional fuel/clean fuel
Source of drinking water	piped water/collected from roadside/tanks, tube well
Water storage in the house	open container/closed container
Personal hygiene	hand wash before eating/after visiting toilet
Most frequently reported diseases in the family	diarrhoea, dysentery, cholera, jaundice, malaria, tuberculosis, asthma, cough/cold, typhoid

sq.km. The whole city of Aligarh is divided into 60 wards (which is an administrative unit). These wards are further sub-divided into Mohallas. The study area, being situated in the shadow of the country's capital city i.e. New Delhi, is under the tremendous pressure of its growing population. Due to lack of adequate housing at affordable prices to poor on one hand and continuous flow of migrants on the other hand, a number of slums have rapidly come up in recent years. In fact, the city is dotted with slum's cluster. The objective of the present endeavor is to assess the environmental conditions in and around the slums and to evaluate how this social cluster 'slums dwellers' are facing health problem distinct to these communities that are not well recognized by the formal health sector.

Data Collection

The study is entirely based on primary source of data drawn with the help of a questionnaire from a comprehensive survey of ten major slum areas of the Aligarh city. In the selection of sampled slum areas of the city the United Nations (2002) operational definition of slums "a slum as a human settlement that has the following characteristics: 1) inadequate access to safe water; 2) inadequate access to sanitation and other infrastructure; 3) poor structural quality of housing; 4) overcrowding; and 5) insecure residential status" is applied. This definition is applied because these characteristics describe communities that comprise 43% of the combined urban populations in all developing countries, and 78% of the urban population in least developed countries (UN 2002). Apart from it, keeping in mind the problem of the study are, the study on the basis of this definition will highlight Indian problem in particular, and problem of developing and least developing countries in general.

Out of ten major areas, three areas are located along railway track, three along the highway, three near the depression/low lying land and one on vacant land. A total of 682 persons were entertained. The field work was done in two periods of time i.e. first time in the months of November-December 2001, and second time in May-June 2009. A responsible person aged 18 or above is interviewed with the help of pre-structured and pre-tested questionnaire. Information is procured regarding the personal characteristics of the respondents, living conditions, environmental conditions and health profile. The questionnaire consists of the following variables.

METHODS

The data collected from the field survey were organized, moderated, tabulated, and analyzed with the help of suitable statistical techniques. For the data analysis, tools of descriptive statistics and some basic tools of analytical statistics were applied. In a first step, data from the ten surveyed slum areas is merged to generate larger database and the analysis of this joint database focused on the environmental condition in the sampled area and its impact on health profile of the respondents that represents main objective of the present work. A list of selected variables was prepared and bivariate analysis performed, trying to identify associations between specific problem and health outcomes. During bivariate analysis, two variables i.e. X and Y referring to major risk factors and associated health outcomes as independent and dependent variables respectively has been selected. The major risk factors taken into consideration are; use of conventional fuels (X_1), smoking (X_2), drinking water from

roadside pipes/tube well (X_3), use of open container for water storage (X_4), open defecation (X_5), poor personal hygiene (X_6), open drainage (X_7), and garbage spread everywhere (X_8). The common health outcomes include respiratory infections (Y_1), tuberculosis (Y_2), whooping cough/cold (Y_3), throat/eye infections (Y_4), diarrhoea/dysentery (Y_5), cholera (Y_6), typhoid (Y_7), jaundice (Y_8), dermatological problems (Y_9), and malaria (Y_{10}).

The study is being mostly descriptive have the advantage of giving a humanistic understanding of the problem, and are also the basis for data analysis and conclusions. For the study, both subjective and analytic approach was adopted, implying that the analysis can provide meaningful associations and descriptions of variance and to explore the major parameters relevant for further research. Therefore, the prime objective of the study was not to determine any causal relationship but to highlight the increasing health burden in urban centres due to this unauthorized settlement.

RESULTS AND DISCUSSION

The present analysis based on information collected two periods of time to find out the temporal variation in the number of slum units, living condition and health profile of the slum dwellers. During field survey a positive growth rate (41.65%) in the number of slum units has been observed indicating towards increasing growth rate of migration. The analysis depicts that the large proportion of the residents is rural migrants having 8 and more than 8 family members (Table 1). These migrants are mainly from surrounding state namely Bihar, and also from economically deprived districts of Uttar Pradesh itself. The reasons for their migration were mainly lack of employment opportunity, natural disaster (flood) and debt at their own place. Same reasons of distress migration were also identified in other studies (Premi 1991; Kundu et al 2001). The slum dwellers in the study area use to set up their structure wherever vacant land is available which numerically increases with the passage of time. Their slum units are predominantly consisting of wooden shacks, dirt, gravel, and polythene providing breeding ground for all type of disease vectors. Unlike the slum dwellers of metropolitan cities, these people were very poor, illiterate and unskilled who were not legally employed in any formal sector occupations. They were self-employed or having own small businesses. A positive change has been observed in their education level as well as in occupational structure (Table 1). In 2002 the percentage of rickshaw puller was 50.75 per cent that reduced to 43.23 per cent in 2009. Majority of the slum dwellers were found to employ in low-paying occupations especially in the domestic services, the solid waste recycling, and day labour. These people are excluded from the usual benefits provided to urban residents including minimal wage compensation.

Considering the amenities and facilities available to the slum dwellers, it has been found that there is lack of water supply and sanitation facilities. Hand pump continuously appears to be the main source of drinking water that increased from 59.23 per cent (2002) to 62.19 per cent (2009). Otherwise, people are use to line up at neighborhood standpipes, or tap pipes illegally to obtain water for both drinking and domestic purposes. Use of open container for water storage was found to be a common practice but it showed decreasing trend (-6.88 per cent). As the Table 1 depicts complete absence of toilet and bathroom facilities in sampled slum areas, the dwellers were found to depend on public lavatory system which showed an increasing trend. It increased from 38.75 per cent in 2002 to 42.36 per cent in 2009, whereas open defecation slightly decreased from 61.25 per cent to 57.64 per cent in the respective years. During field survey it has been found that they defecate in pits or in the open or in ditches, or along the transportation line, and maintaining poor personal hygiene. To take bath they fully depend on public hand pump and roadside water connection.

As far as environmental condition in and around the slum units is concerned, open drainage, spread of garbage and air pollution was reported by 100 per cent of the respondents in both the years of study (Table 1). There is no drainage system and dwellers generally dispose off waste water around their living place. Similarly, solid waste collection in these areas is very rare, providing breeding ground for various disease vectors. Infact, these sampled areas have been found to be characterized by urban decay, high rate of poverty, unemployment, and are also a "breeding grounds" for social problems such as crime, drug addiction, alcoholism, high rate of mental illness, and suicide.

To assess the disease profile and its relationship with household environmental conditions, most frequently reported diseases in the respondents' family were taken into consideration. During 2002, respiratory infections were observed as a major health problem reported by 62.37 per cent of the respondents, followed by whooping cough/cold (61.89 per cent), diarrhoea/dysentery (58.06 per cent), dermatological problems (51.39 per cent), cholera (48.21 per cent), typhoid (42.63 per cent), tuberculosis (39.74 per cent), malaria (38.16 per cent) and jaundice (28.57 per cent). In the year 2009, no sharp change in the health profile of the respondents was observed. Both upward and downward trend was observed in occurrence of diseases. Respiratory infections continue to be a major health problem despite showing decreasing trend. It was followed by whooping cough/cold (58.23 per cent), dermatological problems (56.42 per cent), diarrhea/dysentery (54.23 per cent), typhoid (45.29 per cent), cholera (45.61 per cent), malaria (41.55 per cent) and dermatological problem (38.14 per cent).

Table 1: Aligarh-General Characteristics of the respondents

Variables	2002	2009	% of change
Family Size	N=281	N=401	
Small =4	12.75	8.95	-29.80
Medium= 5-8	34.82	49.33	41.67
Large= >8	52.43	41.72	-20.42
Education Level			
No Education	63.54	57.18	-10.00
Primary	20.74	23.52	13.40
secondary	15.72	19.30	22.77
Profession			
Daily wager	49.25	56.77	15.26
Rickshaw puller	50.75	43.23	-14.81
Housing Material			
Polythened	21.47	18.76	-12.62
Thatched	19.66	24.81	26.19
Mixed	58.87	56.43	-4.14
Bathroom and Toilet Facilities			
Use of public lavatory	38.75	42.36	9.13
Open defecation	61.25	57.64	-5.89
Drainage system around the units			
open	100	100	-
closed	-	-	-
Garbage around the unit			
Spread everywhere	100	100	-
Not spread everywhere	-	-	-
Cooking Fuel			
Traditional fuel	100	100	-
Clean Fuel	-	-	-
Source of drinking water			
Hand pump	59.23	62.19	4.99
Roadside connection/tank	40.77	37.81	-7.26
Water storage			
Open container	61.45	57.22	-6.88
Close container	38.55	42.78	10.97
Personal hygiene			
Hand wash before meal	39.62	45.88	15.80
Hand wash after visiting toilet	41.37	56.28	36.04

During survey, negative growth rate in the case of tuberculosis
was observed that is mainly due India's DOTS programme against tuberculosis. Similar result was also found in research work conducted by Agarwal (2005).

During study it has been found that many health problems in the respondents stem from the lack of access to safe drinking water, clean sanitary environment, inadequate living space and poor personal hygiene which are very much consistent with other studies (Howard 1993, Marsh 1982, Mood 1993). Respiratory infections and tuberculosis have been observed as major health problems, showed strong positive correlation with conventional fuels ($p<0.01$), smoking, poor personal hygiene and open defecation ($p<0.05$) which is the typical characteristics of the sampled slum areas. The leading role of these factors were also identified in other studies conducted elsewhere (Singh 2001, Fonseca et al 1996 and Graham 1990). Water-borne diseases such as diarrhoea, dysentery, cholera, and typhoid appeared as second major health problems and showed significant positive relationship with water from roadside ($p<0.01$) and use of open container for water storage ($p<0.01$). The role of the contaminated water in the occurrence of these diseases has also been found in numerous studies(Table 2). Features of substandard living condition, including lack of safe drinking water, poor sanitation, ineffective waste disposal, intrusion by disease vectors (e.g., insects and rats) and inadequate food storage have been identified as major contributors to the spread of infectious diseases

Table 2. Aligarh-Relationship between Environmental Conditions and Occurrence of Diseases

Respiratory Infections/ Tuberculosis	Traditional fuels	Smoking	Poor personal hygiene	Open defecation
	**	**	*	*
Cough & cold/ Throat & eye infection	Water from roadside	Open water container	Poor personal hygiene	Open defecation
	*	*	**	**
Diahea & dysentery/ Cholera & Jaundice	Water from roadside	Open water container	Poor personal hygiene	Open defecation
	**	**	**	**
Malaria	Garbage everywhere	Open drainage	Poor personal hygiene	Open defecation
	**	**		
typhoid	Garbage everywhere	Open drainage	Water from roadside	Open water container
	*	*	**	**
Dermatological problems	Poor personal hygiene	Open defecation	Garbage everywhere	Open drainage
	**	**	*	*

$** = p < 0.01$; $* = p < 0.05$.

Table 3. Aligarh-Health Profile of the Respondents

Diseases	2002 (n=643)	2009 (n=643)	% of change
Respiratory Infections	62.37	60.22	-3.44
Tuberculosis	39.74	31.26	-21.33
Whooping Cough/Cold	61.89	58.23	-6.28
Throat/Eye Infections	51.76	48.24	-7.29
Diarrhea/Dysentery	58.06	54.23	-6.59
Typhoid	42.63	45.29	6.23
Cholera	48.21	45.61	-5.39
Jaundice	28.57	31.24	9.34
Dermatological Problems	51.39	56.42	10.21
Malaria	38.16	41.55	8.67

In thesampled slum areas (Table 3) which is very much consistent with the findings of WHO. It is estimated that nearly half the urban population in Africa, Asia, and Latin America have one or more of the main communicable diseases associated with inadequate water and sanitation provision including diarrhoeal diseases and worm infections (WHO 1999). Inadequate provision for drainage and sanitation also increases other infectious diseases like malaria, dengue and yellow fever as the vector breeds in accumulated water, piles of garbage and soak away pits (UN-Habitat 2003, PC 2002 and MoHFW 2007).

The study concludes that in India, slum settlements have become the norm of urban society. The rapid and unplanned urbanization and simultaneous growth of urban poverty has been increasing the number of slums in urban centres across the country. When infrastructure and services are lacking, slums have become one of the world's most life threatening environments. Therefore, many issues for the improvement of well being of slum dwellers need to be addressed. During study it has been observed that slum dwellers are mainly from rural areas because agricultural land can not support the entire population in rural areas. So, every day massive stream of people from the rural areas are flowing into the urban centres. That is why; various regional plans are required for different parts of the surrounding states. Within each region, through industrial and zoning policies, attempt should be made for the total development of an area rather than a partial development that would help to reduce population pressure in urban centres. Stress should be given to the policies which will result in the creation of job opportunities in areas and zones from where the migrants originate especially in rural areas through the mechanism of vertical diversification of agriculture, involving development of downstream activities like cleaning, sorting, packing and processing of produce at farm level. Besides, the existing economic produce of different crops will be redefined and manufactured products will add additional values to the produce, such as use of fruits for canned juices, syrups, jam, and jellies. If the gap between the urban and rural areas will be substantially bridged, and a qualitative change in rural life especially gainful employment

opportunities will be created through the integration of rural and urban economic activities, the migrants to urban centres will be declined substantially.

At planning level, planning for city should consist of operational and developmental aspects. Operational planning should take care of improvement of urban infrastructure, whereas, developmental planning should emphasize on development of newly annexed urban areas. In general, it should involve in development of strong economic base for urban economy to provide employment opportunities to all section of society and housing for vulnerable section of the urban centres.

Moreover, development and proper implementation of clear urban health policy and program strategies; investment in more services like reorienting and sensitizing doctors/nurses; well equipped dispensaries and maternity clinics near slums, and involvement of NGOs that can fill the service delivery gap in health services mainly through awareness generation activities and impart relevant information to young girls/boys about health/hygiene and enable them to understand the role of environment in health conditions is the need of the hour.

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