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Slum Settlement Problem and Solution: A Case Report of Karachi

Muhammad Umer Khan, Haq Nawaz Abbasi*, Waqar Ahmad, Muhammad Imran Nasir*

Department of Environmental Science, Federal Urdu University of Arts, Science and Technology, Karachi, Pakistan

*Corresponding Author

Haq Nawaz Abbasi
Muhammad Imran Nasir

E-mail

hn.abbasi@fuuast.edu.pk
imrannasirc@gmail.com

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Abstract

A large population of the world lives in unplanned urban areas where slums settlement receives little to no planning and management. In spite of advancements in urban infrastructure, jobs, sanitation, etc., slums management is the world's most rapidly increasing form of human settlement problems, especially in developing countries. Karachi is the capital city of Sindh province and largest city of Pakistan, where in recent years urban issues such as insufficient basic facilities have coupled with environmental problems that are seriously impacting the public life. Currently, concerns regarding urban ecological environment are the most noticeable warning signs confronted by a slum dweller. Contaminated drinking water, untreated sewage waste, and zero solid waste management is a public health issue. In this article, we highlighted a number of key environmental problems together with their potential solutions about slum settlements in Karachi, Pakistan; although there is a lack of holistic public policy including social, economic and environmental challenges.



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Introduction

Slums is identified as an area of unplanned human habitation which can be found nearly in every country. Approximately one-third of the world's inhabitants live in slums [1]. Ooi [2] defines a slum where peoples live in area that is deficient in one or more of the following conditions: having access to potable water, access to hygiene, residential security, stable accommodations, or adequate living space for inhabitants. Main causes of slum include the rapid rural-to-urban movement, no financial resources, job availability, government financial crisis, hopelessness, redundancy, poverty, unexpected market fluctuations, poor development, political affairs, natural calamity and community divergence.

Worldwide, nearly one billion people live in inadequate shelter, mostly in developing countries [3]. The shortage of safe and affordable housing is because of poor construction skills, insecure land tenure and limited access to financial mechanisms. Peoples with low income build their houses incrementally through informal funding but these structures are vulnerable to disasters [4]. Slums (informal settlements) often occupy peri-urban locations that are situated outside the city centre are unique feature of the cities especially in the developing countries. Around one billion peoples (one in seven people) live in self-built homes (slum), and by 2050 this number will reach to 3 billion (**Figure 1**)[5]. Slum dwellers face distinct challenges such as insecure land tenure and unsafe housing public services such as electricity grids or sanitation infrastructure, moreover, close living quarters, increases their risk of getting infectious diseases [6]. These areas tend to attract vulnerable populations and are often poorly equipped to deal with disasters and extreme events. Gastrointestinal, respiratory and skin infections are common in slum regions [7], moreover insufficient management favors disease transmission through water, air and insect vectors [8]. Chronic diseases such as obesity also often accompany urbanization as people's lifestyles change [9].

The 21st century has been entitled as the “century of the city” as half of the world's population lives in city regions [10]. Millions of urban peoples in the developing countries have a little health opportunity and breathe in unnoticed, hazardous environment where they face numerous threats to their health and shelter. The environmental conditions typically found in slums create a number of detrimental and

dangerous effects on the slum neighborhood itself [11].

Karachi: Geographical Structure

Karachi is known as “city of lights”, metropolitan city located south of Pakistan, on the coast of Arabian Sea and is the capital of Sindh province. The city covers an area of approximately 3,527 square kilometers and densely populated with estimated 23 million inhabitants. Karachi is expanding at a rate of approximately 5% yearly mainly because of rural to urban migration. 45,000 settlers typically come to city each month from diverse parts of Pakistan seeking employment [12].

Karachi has an enjoyable climate for the larger part of the year. May and June are the hottest whereas January and February are the coldest months. The average rainfall is approximately 10 inches per year, the bulk of which occurs during the July-August monsoon season.

The metropolitan area is facing pollution problem due to lack of environmental care awareness among people [14]. This city is recognized as the most important industrial city of Pakistan but on the other hand, Karachi also has the notoriety as the leading disease-causing city of Pakistan because of its intolerable air and noise pollution; 35% population of the city suffers from numerous diseases attributable to pollution [15]. Karachi has experienced rapid urban intensification resulting in slum developments as the dominant form in some areas of the metropolitan region. At the same time, this municipality is one of main civic, political, educational as well as financial pillars of Pakistan. Karachi city was incorporated in a well-known name “Planet of Slums” by Davis [16]. It is mostly for the reason that more than fifty percent of the metropolitan inhabitants live in slum settlements, locally called Katchi Abadis (non-permanent or slums). According to a study and statistical projection, a number of unauthorized approximations propose existence of 702 Katchi Abadis (non-permanent or slums) in Karachi [17].

Informal Settlements in Karachi

In the northwestern part of Karachi, there are many diverse improvised slum settlements. Unplanned developments of Karachi differ in age, establishment and racial mix. The majority of these developments

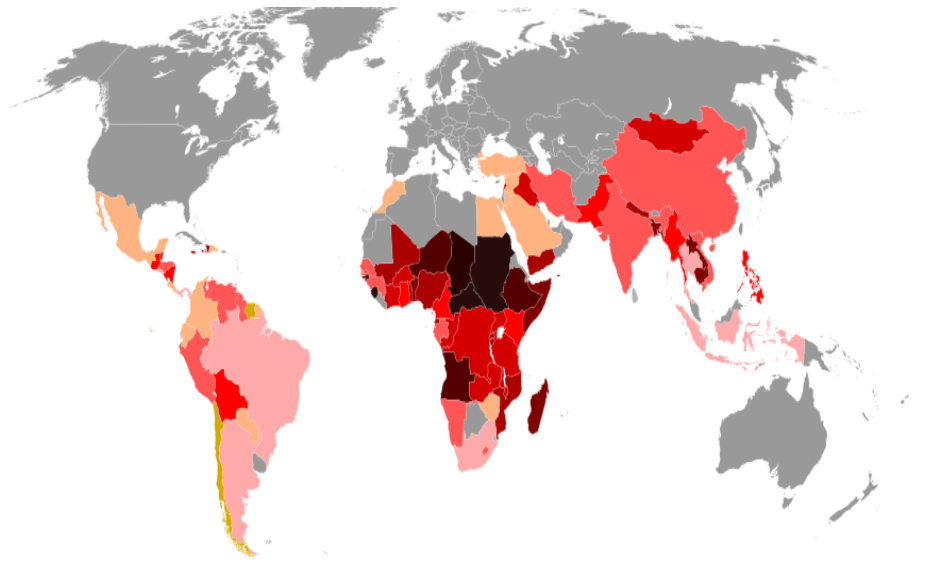
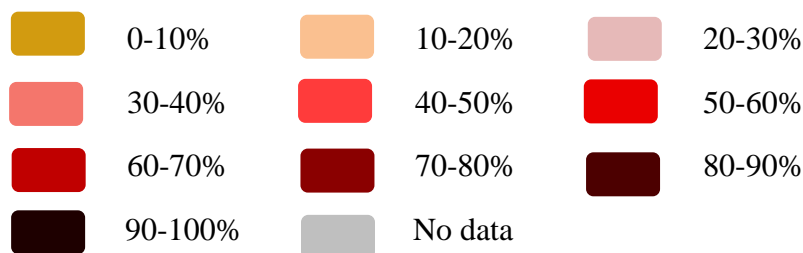


Fig. 1: Map showing urban population living slum in the world [13].



are the result of unlawful division of land. Inhabitants with small subsistence income in Karachi are the major cause of elevated rate of poverty as well as scarcity of adequate decent housing. This problem however, should be viewed from a broader socio-economic perspective. Typically, a new settler causes a rapid rise in the number of low-income residents of the region. Due to the feeble economic formation, this populace cannot find high-pay employment in proper areas of the Karachi economy and consequently but occasionally these new settlers are forced to resort to criminal behavior. Another characteristic of economically impoverished slum-dwellers is high-density congestion, with numerous families packed in a single room without proper sanitation access. Public health issues such as diseases, tuberculosis as well as measles, multiply rapidly in such circumstances. In addition to the various localities in the slums of Karachi, Orangi Town located in the northwestern boundary of the city is perhaps the more important. It is the biggest town of Karachi and has a populace of

approximately 2.5 million and is considered as one of the leading slum settlements of Asia.

Orangi Town is located within the Karachi metropolitan region and is exemplified by means of financial, ecological and bureaucratic issues. Rapid urbanization and lopsided city expansion have caused many problems that constantly supply to the life of Katchi Abadis (non-permanent or slums) in metropolitan boundaries of Karachi. This is a large urban growth hub struggling with outward mitigation by people living within its slum regions (**Table 1**). Inhabitants face limited buying power due to price rises of daily necessities, such as food, fuel and continually deterioration environmental conditions. Thus, it is tremendously complicated for a deprived population in the slums of Karachi to ever improve their dwellings and deal with environmental conditions, particularly when they live at a subsistence level. This condition is expected to cause an ever-increasing center of poor living quality in Karachi City. **Figures 2** (a-d) represents typical

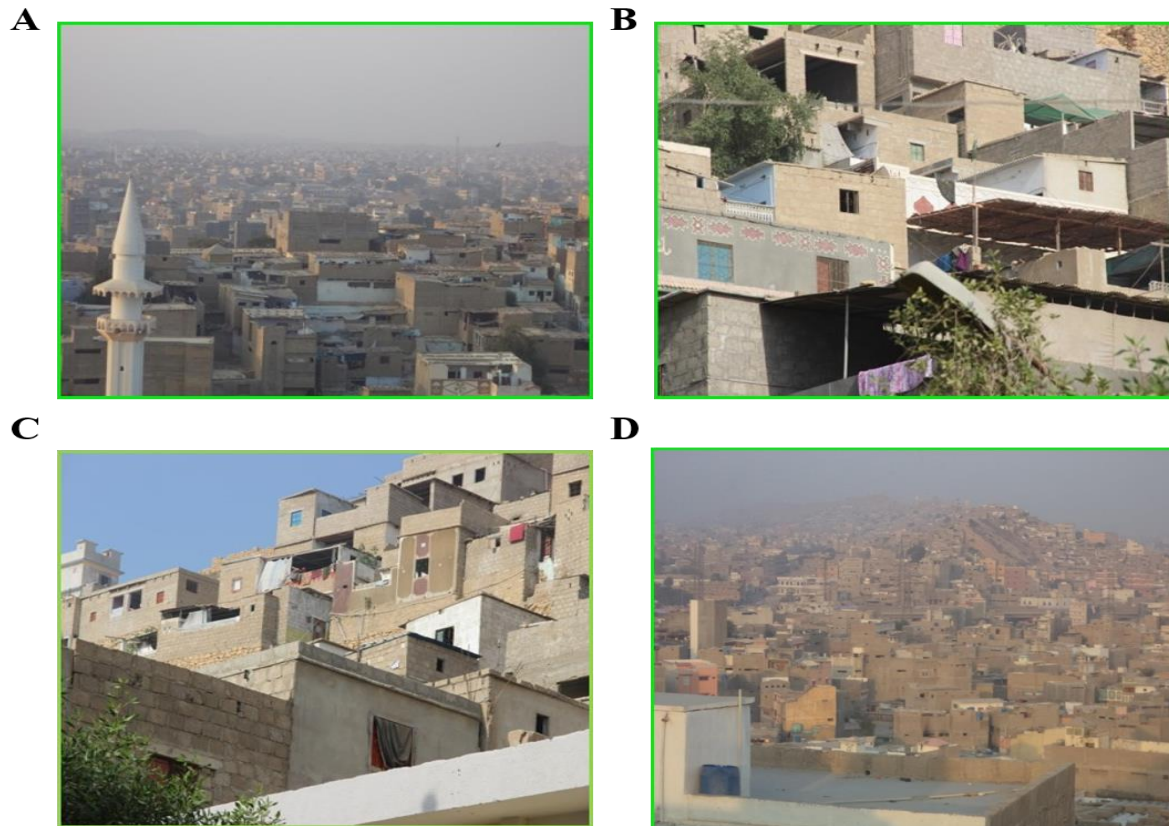


Fig. 2: (A-D) Showing slum settlements in northwestern part of Karachi.

casual conditions of slum settlements in the northwestern part of Karachi.

Environmental Quality

Environmental crams have been reported by a number of researchers [19-23] thereby revealing Karachi as one of the mainly susceptible cities prone to facing the ecological challenges of this century. In addition to the acute demographic and social conditions describe above, Karachi is also facing numerous environmental issues, which to date have failed to attract suitable attention from the official administration of the city. A key factor that has helped to create many of the environmental issues is related to the continued rise of slum inhabitants, and unaccommodating landscape, as well as the lack of adequate planning to accommodate growth pressures.

Similarly, there is a great demand for improved housing, protection of the water supply, providing functional sanitary waste removal, hygiene and healthcare, etc. From a professional planning perspective, these slums represent an environmental

and demographic time bomb, even beyond the carrying capacity for a human community threshold.

Table 1: Population facts of Karachi 1950-2035.

Years	Population	APGR (%)
1950	1,055,380	-
1955	1,419,491	6.11
1960	1,853,325	5.48
1965	1,405,037	5.35
1970	3,118,723	5.33
1975	3,989,191	5.05
1980	5,047,815	4.82
1985	6,032,582	3.63
1990	7,147,046	3.45
1995	8,467,439	3.45
2000	9,825,295	3.02
2005	11,131,559	2.53
2010	12,611,924	2.53
2015	14,289,160	2.53
2019*	15,741,406	2.45
2020*	16,093,786	2.24
2025*	18,076,794	2.35
2030*	20,431,848	2.48
2035*	23,128,137	2.51

Here APGR = Annual Population Growth Rate whereas * is Projected population Source: [18]

Table 2: Categories of main issues and proposed solutions in Karachi.

Issues	Proposed solutions
Lack of drinking water	Install the warka water condensation system and ensure pipeline distributions systems as well as water quality.
Lack of sewerage systems	Construct bamboo pipelines to channel effluents toward the constructed wetlands
Safe cooking fuel	Place biodigestors and construct artificial wetlands around these gas suppliers for cooking in key strategic areas
Electricity	Install wind and sun power system
Garbage management	Establish an integrated recycling system with education strategies
Pave roads	Implement ecological roads
Footpaths	Use nearby quarries and bamboo to establish trials around the neighborhood
Street lighting	Use energy efficiency led lights technology
Ambience temperature regulation & aesthetic value	Install green roofs and walls with plants for food

Inhabitants not only generate environmental pollution during their unplanned and disorganized squatting, they also contribute to dumping of untreated human waste, thus creating both air and water pollution, because of not having individual sanitation. These are amongst the majority significant environmental issues in the area. To sum up, these slums are a major source for water pollution from untreated runoff, sanitary pollution from untreated grey and brown water.

In the slums of Karachi, basic services such as water supply and sanitary hygiene are extremely poor and do not meet the requirements of the massive population (**Figure 3**). People are presently facing shortage of water supply and sanitation services simply because they are living in an unlawful squatter community.

These slums discharge their waste openly into the low-lying areas. Most of the settlers have inadequate toilets. In addition, the accumulated waste (trash) makes a mountain of rubbish frequented by the children of the slums. Biomedical waste creates an extraordinary risk towards residents' health along with waste disposal. In addition, this waste provides a place for breeding of mosquitos causing malaria and/or dengue fever. A study shows that general health problems like, fever, diabetes, diarrhea, high blood pressure, flu, headaches, stomach pain, malaria, kidney problems, and measles are smaller common diseases, several of which are more widespread in a certain part of the slums [24].



Fig. 3(A-D): Open discharge of sewage and waste from slum settlements.

Household cooking fuel

Because of lack of energy supplies, the majority of inhabitants within slums burn biomass to prepare food. This enormous quantity of biomass combustion generates a number of different adverse environmental conditions such as deterioration of outdoor air quality, reduction of vegetation coverage, indoor air pollution, and deterioration of health. A small number of these private residences have been supplied with petroleum gas; however open fires fueled by wood and paper products are still the preferred technique for cooking. Many of the problems occurring from this method of cooking are

causing worsening of air quality in the slum and greater city area.

Conclusion

There is no large hospital of any type that can provide health services for slum inhabitants. Physical conflicts are a regular unlawful resident phenomenon. In addition, many people are involved in prostitution, drug smuggling, kidnapping, human smuggling, and so on. These issues greatly threaten the city's social and cultural environment. Slum settlement areas are facing redundancy, horrendous hygiene, and environmental problems such as water pollution, effluence discharge, and scarce access to potable water, cleanliness health services and deforestation. In the surrounding area prone to severe climate and natural disasters are now even more vulnerable because of the livelihood of numerous slum inhabitants. Lack of sufficient transportation services, as well as water, sewage, solid squander collection works and are subjected to insecure accommodation, unsatisfactory food and health problems. It is mandatory to advance with innovative and tailor-made solutions in accordance with the environmental circumstances of these slum settlement areas.

Potential solutions

Promote better educational programs in order to align efforts towards development of Pakistan. Provide better opportunities for job to slum people while enhancing their quality of life. Keep slum people out of fluctuant policies mandates by empowering grassroot communities. Provide proper sanitation services. Enact public socioeconomic and environmental awareness program in building ecological and economic slums.

Develop better agricultural public policies to make slum people return to their agricultural lands. Develop a multi-stake holder analysis previously. Establish public-private partnerships. Disseminate Green milestones through the World Wide Web in transforming Karachi into a better city with adequate planning and management. Open and establish political forums among corporations, government agencies and NGOs to educate political leaders. Change mindsets towards environmental awareness without undermining their cultural beliefs. Approach to the Eco2 Cities Initiative by the World Bank.

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