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Slums as a Barrier to Urban Development in Kolkata — a case study of urban planning

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Abstract

Slum is an integral part of urban life; urban development is not the phenomena keeping them aside. Slum dwellers are urban poor. In spite of a number of plan and policies implemented for their development what is actually achieved is the rampant miserable condition of slum life even in metropolitan cities of developing countries like India. One in six urban Indians lives in slum housing that is cramped, poorly ventilated, unclean and unfit for human habitation. Such true features like living of urban poor on the heap of city garbage and solid wastes, and taking bath together with cattle in small, stagnant water body connected with toilet and latrine of houses, and also dumping ground of household's solid wastes, do not reveal true feature of urban development. Unplanned and improper land utilization in slum area leads to the problem of lack of living space and unhygienic condition there. Present research paper based on empirical observation is an attempt of analyzing diverse problems in slum life, and also to find answer to the queries of how far such problems act as barrier in achieving urban development.

Introduction

Urban development does not mean keeping the slums away from the fruits of development. Slum is an integral part of the entire urban community and its dwellers constitute a significant portion of urban population. Therefore, development of all sections of people living together in an urban area will collectively reveal a complete urban development. But many of the urban areas, irrespective of size and class exposes slum characteristics with people living in unhygienic, dearth of accessibility to physical infrastructure, lack of adequate living space, improper and unplanned space utilization, insufficiency and irregular supply of drinking water, educational deprivation and least employability, prevalence of all types of social evils and thereby socially unsafe and insecure etc. Such problems of slum areas need to be immediately addressed with more concern to call the urban area a developed one. 'Urban' refers to an area where a multiplicity of communities of substantial size and density live with a variety of non agricultural pursuits, including a high literacy rate with good infrastructure facilities (Mandal, 2007).

When we talk about slums, the impression is that of a dirty, unhygienic cluster of impoverished shanties with long lines of people crowding around a solitary municipal water tap, bawling babies literally left on street corners to fend for themselves and endless cries and voices emanating from various corners. Most of them are engaged in eking out their daily lives, always below the poverty line, by working as construction labourers, domestic workers, rag pickers and *chhotus* (child workers) in neighbourhood *dhabas* (road side eateries in open sky). Though their living conditions are utterly unhygienic, gloomy, dismal and dehumanized, many of them still dream of improving the quality of their lives.

The majority of slum dwellers identify themselves with the city rather than with their native place and plan to settle permanently in the city. In spite of poor condition in slums, second generation residents who are not nostalgic about their rural background feel that life in slum is reasonably tolerable and city life is probably better than the rural life. One in six urban Indians lives in slums where houses are cramped,

poorly ventilated, unclean and unfit for human habitation, according to the country's first complete census of its vast slum population. In other words, nearly 64 million Indians live in a degrading urban environment very similar to the shantytowns portrayed in the Oscar-winning movie *Slumdog Millionaire* (Rahman, 2013).

The slum population is constantly increasing: it has doubled in the past two decades. The current population living in slums in the country is more than the population of Britain. India's slum-dwelling population rose from 27.9 million in 1981 to over 40 million in 2001 and 93.06 million in 2011 (Census of India 2011). Every eighth urban children in India in the age-group of 0 - 6 years lives in slums. About 7.6 million children are living in slums in India and they constitute 13.1% of the total Indian urban children of 26 States/Union Territories (Deshpande, 2011).This growing slum population and the lack of basic facilities exerts an ill-impact on India's overall target achievement in water and sanitation sector. A Committee headed by Pranob Sen, Principal Advisor to the Planning Commission, states that the projected slum population in the country in 2011 would be 93.06 million from 75.26 million estimated in 2001. This means one out of every four persons reside in slums in our cities and towns.

Slums in Indian Cities

Opportunities in cities act as gravitational pull for rural people to migrate to the cities. Poverty with low income forces them to be closer to work place; hence, they occupy any land in the surrounding area. All these along with the vicious circle of population growth are some of the basic factors of slums in urban life. After independence in 1947, commercial and industrial activities required low-cost labour in the cities; this was available in the rural areas. They were encouraged to come to cities and work. People, who migrated to the cities and found work, brought their relatives, friends and rest of the families to the cities. But they did not find housing within their capability and the type of housing they found was out of their reach. So they decided to build their shelter closer to work place (city) to minimise the travel cost. As soon as a shelter comes up, the number increases geometrically with time, quite haphazardly on a spatial frame to finally compose what we call 'slums'.

Slums are treated as the vote bank by different political parties. Politicians use these unauthorized dwellers as their force and the slums get permanent shape in cities. By mid-1960s Mumbai, Kolkata, Delhi, and all other big cities were dotted with slums (Hari, 2006). Slums are considered as an integral part of the phenomena of urbanization in India. The majority of slum dwellers want to settle in city rather than go back to their birth place. Slums act as a barrier of urban development. In 1901 India had 11.4% urban population of total population, which increased to 28.53% in 2001 and 31.16% in 2011. On the other hand, India's slum population rose from 27.9 million in 1981 to 40 million in 2001 (Nair, 2009). Slums were never considered for planning and designing, hence they remained unplanned and undeveloped areas in a city.

Sustainable Urban Development

Urban planners consider maintaining sustainable development in expanding and renovating urban areas. When an urban area approaches into natural regions, much care is taken to integrate the natural milieu with the developing city. Sustainable development in urban expansion focuses on reduction of the level of environmental pollution on the one hand and increasing the availability of recycling facilities and focusing on the efficient use of alternative energies on the other hand. In the context of urban sustainable development, planners and policy makers must concentrate on issues like removing pollution producing facilities, reusing building materials, and improving existing recycling facilities.

Sustainable development of urban areas through urban renewal and expansion requires transformations of existing neighbourhoods, industries, transportation systems, sewage and waste management systems, etc. In the aftermath of hurricane Katrina urban developers in New Orleans are considering how to build a city safe from natural disasters, but also retain the vibrancy and culture of the famous city (Fainstein, 1999).

Indicators of Urban Development

A. *Environmental Considerations*

1) Adequate Supply of potable drinking water
2) Healthier indoors and out door air quality
3) Noise pollution level not exceeding tolerable limit
4) Efficient and safe transit system
5) Adequate accessibility to quality sanitation irrespective of economic class as well as social sections

B. *Economic Considerations*

1) Well planned housing with proper ventilation system
2) Accessibility to transportation and other public facilities

C. *Social Considerations*

1) Full confidence on safety and security
2) Higher literacy rate
3) Control on death and birth rate, death of women during pregnancy period and at child birth, infant mortality rate.
4) Higher life expectancy
5) Higher rate of employment
6) Absence of social evils like crime, juvenile delinquency, snatching and eve-teaching, drug addiction, pick pocketing, domestic violence, dowry system, child marriage, child labour

Slums as a Barrier to Urban Development

Barriers to access to the civic amenities and services can be defined in a number of ways and each has its consequential implication in planning and policy formulation. In one approach, barriers to access to public services can be interpreted as problems of there being not enough service and facilities in aggregate terms or in per capita terms. In second approach, barriers to access to public services and facilities are built as symptom of poverty. In the third approach, barriers to access to civic services are seen as problem of poverty, but as something that needs to be addressed quickly and not something that can be left to the trickle down effect of economic development. In the fourth approach, barrier to access to the public services (e.g. education, health, water) could be considered as capability deprivation.

The prevalence of slum households varies dramatically across cities of the developing world. In some cities, a relatively small percentage of households experience shelter deprivations, or many experience only one barrier to adequate housing. In other cities, a majority of dwellings suffer from two or more shelter deprivations, threatening the health, safety and well being of their inhabitants. This section magnifies the impact of slums on the overall urban development, focusing on the spatial component of slum prevalence.

Literature Review

Dandekar & Sawant (1998) studies about the rapid growth of the Pune city and mention the needs of various services and facility in newly emerge area after surveying the present demand of resident. Government of India (2011) took an attempt to review the trend of urban poverty from 1951 to 2011 in India and evaluate existing programme for the improvement of urban poor. Siddiqui (2005) attempted to find out the slum problem of Pakistan and focused the hyper-urbanization in Pakistan during last 30-35 years has been an unprecedented phenomenon. As per him rapid urban growth in almost all developing countries has been associated with pathological growth of urban slums and the problems of unemployment, crime, traffic congestion, pollution and lack of basic civic services like water, sewerage, electricity, transport and facilities for education, health and entertainment.

Titumir, *et.al* (2004) studied the barriers to access to public services for the urban poor living in slums in Dhaka. He observed that the access to both kinds of services -universal form of services (i.e. services are to be made available to all citizens on a uniform basis regardless of income, status or power such as universal free primary education, the fire service, etc.) and those services where income, position or influence have the capacity to leverage particular individuals or groups is affected by financial circumstances, creating different levels of access and situations in which the urban poor are disadvantageous from the outset. Cilliers (2009) attempted to find a solution to the problem of sustainability, from a spatial planning perspective. Stephenson (2004) examined the determinants of family planning service use and the barriers in accessing family planning services among urban poor women of slums in Pakistan. He observed that the urban poor are both economically and physically disadvantaged in access to services, women identified socio-cultural factors as the greatest barrier to family planning service use.

Objectives of Study

i. To have a theoretical comprehension of the slums as a barrier to urban development
ii. To examine the prevalence of miserable condition of life in slums
iii. To assess, how far slums act as a barrier to overall urban development
iv. To formulate reconstruction plan strategies for slum development.

Database and Methodology

Present research is based on primary information in conjunction with secondary data. Primary information has been collected through field observation and direct interview with the respondent of sampled individual slum household. Total 100 households were selected at random from study area. Raw data has been transformed into simple percentage form for lucid presentation and easy understanding of the facts lies in the study area. The facts derived from analyses were also presented with pictorial method for visual interpretation and photographic technique has also been adopted for depiction of the ground realities of slum area.

Study Area

Kolkata is located in the eastern part of India at 22° 28′ N to 22° 58′ N and 88° 10′ to E 88° 27′ E. spread roughly north - south along the east bank of the Hooghly River. Kolkata sits within the lower Ganges Delta of eastern India. The city's elevation is 1.5 to 09 m (530 ft). Much of the city was originally a wetland that was reclaimed over the decades to accommodate a mushrooming population. Kolkata has a total population of 4,486,679 persons, of which 2,362,662 are males and 2,124,017 are females.

Among the total population, 1,457,273 are slum inhabitants which accounts for 32.48% of total population (Census of India 2011). Kolkata district, which occupies an area of 185 km^2 (71 sq mi), had a population of 4,486,679according to the 2001 census; its population density was 24,252 /km^2 (62,810 /sq mi). This represents a decline of 1.88% during the decade 200111. The sex ratio is 899 females per 1000 males which is lower than the national average.

Total population of Kolkata urban agglomeration is 14,112,536 persons in 2011 accounting a decadal increase of 7.6% much lesser than 19.0% during 1991-2001 and 19.9 percent during

1981-1991. The growth statistics of Kolkata urban agglomeration shows a declining trend of growth tempo (Census of India 2011). For this study purpose we chose to survey in Topsia, because Topsia is one of the ward of Kolkata Municipality (Ward No. 66), where slum population is highly concentrated with urban population. In Topsia the actual scenario of slum can be depicted. Slum population is concentrated in different part of Topsia, and each of these slums have specific characteristics as the per capita income varies from one slum to another, which help to classify slums in no. of groups.

Manipulation and Analysis

(1) Land Tenure Status

Land tenure status reveals ownership of inhabitants to their living houses. In case of houses on *patta* (land given by government to landless people, and not saleable), leased or rented lend, inhabitants remain unable to built permanent house thereby leading to unplanned and haphazard growth of houses. Table - 1 reveals land tenure status of sampled slum households of study area. Total sampled respondents were divided into four successive income groups. In the very low income group (< 700 monthly per capita income) 28.57% households have *patta* land, 42.85% households have rented land, remaining got their land by private land encroached or through occupancy right. In the low (700 - 2000) and medium (2000 - 3300) income group more households have rented land. In the high income group (>3300) maximum households got their land through occupancy right. If we come across through the total scenario of land tenure status, then we can see that 20% households have *patta* land, 52% have rented land. Table - 1 reveals that maximum slum dwellers have no own land. So not only they misused the land where they use to live as they know that it is not their own, but also they didn't construct their houses with proper plan in fear of losing the land in future. This entire situation acts as the barrier of urban development.The analysis reveals single purpose use of house in slum area, which by not following the principle of optimum utilization of space acts as barriers to urban development.

(2) Housing TypeAs already stated for achieving proper urban development, appropriate landuse planning should be formulated and implemented, meaning thereby land should be used properly and houses should be multi-storied to ensure optimum utilization of space. But in slum area most of the houses are made of mud and brick. Absence of multi-storied houses and dominance of single stories mixed houses are acting as barrier to overall urban development in metropolitan cities like Kolkata.

(3) Utilization of House

For sustainable urban development any house should be used for multiple purposes, such as ground floor for parking, first floor for shop, second floor for home industry, and others floor for residential purpose. But in slum area this planning is not maintained (Table - 2). Table - 1 reveals that in very low income group (>700 monthly per capita income) 7 percent houses are used for single purpose i.e., for residential purpose. 91.02% of low income group households' uses part of their house for residential purpose, 6.41% for both residential and commercial purpose and remaining 2.56% for residential and industrial purposes. In case of medium (2000 - 3300 monthly per capita income group) and high income group (>3 300 monthly per capita income group) cent percent houses are used for residential purpose. In the survey area, overall only 2% houses are used for both residential and industrial purposes and only 5% houses are used for both residential and commercial purposes. Table - 3 reveals the different type of houses in slum area. It is depicted from the table that in various successive income groups 71.42%, 60.25%, 55.55% and 66.66% houses are mixed (built of mud and brick). In the very low, low and medium income groups 28.57%, 32.05% and 11.11% houses are *kuchha* (made of mud only) respectively. Only medium and high income some houses are *pucca* (concrete) (33.33%). Empirical observation reveals that proper land use planning has not been formulated and implemented yet for slum development therefore improper land utilization in slum areas in Kolkata definitely acts as barrier to overall urban development.

(4) Cooking fuel

For achieving proper urban development the consideration of pollution control is important. It should be kept in control up to desired level, for that various sources of pollutant (from industrial sector to domestics sector) are to be controlled. But in slum area use of coal, wood and kerosene while cooking releases carbon thereby causes environmental pollution. Use of such cooking fuels is mainly due to the poor economic condition of slum dwellers.In the sample slum area 100 percent of sample slum households uses kerosene, 21% uses wood which releases high amount of carbon, 8% uses coal however only 7% uses gas for cooking purposes (Table - 4). Majority of slum households use environment polluting bio-fuels.

(5) Accessibility to in-house Bathroom Facility

Availability of in-house toilet and bathroom facility is essential to claim a city developed. It is said that absence of toilet and bathroom facility within household will stand as barrier to urban development. If people use open space as their toilet and bathroom, then it will surely pollute that area, environment will be unhealthy for people, bad smell will spread everywhere. In the sample slum, only 2% of the households do have toilet and bathroom facility within their household, however remaining 98% use open space for same purpose. Prevalence of such figures in any area of a metropolitan city surely does not reveal its development. Non-availability of such in-house facility again is attributed to the economic factor and non-ownership of land in slum area. Table - 5 reveals that in the very low, low and medium income group only few households have toilet and bathroom facility and in high income group 33.33% households have that facility.Safe and adequate supply of drinking water to the inhabitants of a city comes under

the consideration of urban planners. Table - 6 presents the situation of water supply in slum area. Cent percent households of all income group availing piped water supplied by municipality timely in regular manner (8 AM to 10 AM in morning and 4 - 6 PM in evening) in the slum area, which is not sufficient for fulfillment of their needs.

(5) Drainage around the Premises

Nature of house-frontal drainage whether or not concrete and closed is important determinant of inhabitant's level of living, quality of life and their overall well-being. In all successive income groups 52% o the respondents reported about the existence of drainage system while other (48%) reported non-existence of drainage system in front of their household. Among all the existing drainage facility in study area 3.85% and 96.15% respondent reported about the existence of open and closed drainage respectively. Therefore, required drainage facility in slum area is not available which act as a barrier to urban development. Existing drainage should be closed in nature which that no insect can increase their population in drainage water.

(6) Mode of Garbage Disposal

For maintenance of urban environment households' wastes should be collected regularly, otherwise it will create some unhealthy smells and various insect will find their breeding place on domestic dump causing spread of various diseases around the area. Table - 8 present the scenario of mode of household waste disposal in slum area. It is observed that people dump their household waste in various places such as official dump, collection point, roadside etc. Some people burn their household wastes. Overall 51% of sample households dump domestic wastes in official point, 9% dump in collection point, 36% use to dump along roadside and 4 percent burn their domestic wastes. The practice of dumping of domestic wastes along road side causes the spread of bad smell from there and polluted slum environment. These dumping grounds are suitable breeding ground of various insects which spread verities of diseases over the area. Entire situation exposes as barrier to urban development in the study area. From the urban development view point, various collection points should be identified in urban area, from where wastes materials can be collected on regular basis.

(6) Garbage Collection

Collection of wastes on regular basis is essential making the area beauty, healthy and human habitation. Table - 9 reveals 89% of the respondents reported that domestic wastes are collected irregularly from the sample slum area; however 11% reported that the wastes are collected regularly. From empirical observation it is clear that domestic waste is not properly disposed in slum area, which causes environmental pollution in slum area, thereby act as barrier to urban development.

Recommendation for Restructuring Plan

Following are the plan recommendations for restructuring of slum area in order to achieve integrated slum development which would make the city sufficient to claim a developed one.

1. *Multi-storied Building*

For minimisation of shortage of living spaces, one important measure is optimum utilisation of land. In the study area it is observed that maximum slum houses are single storied, which reveals that one small unit of land provides shelter to few people. If those buildings are turned into multi storied ones then the same land can provide shelter to number of people, which not only solve the shortage of housing problems but also create an opportunity to establish another more facilities (such as recreational ground, school, club, health centre, etc).

2. Land use Planning

i. Multipurpose use of Land

Multipurpose use of land means utilisation of land for other than single purpose (residential purpose), residential land can be used for both residential and commercial purposes, and residential and housing industrial purposes. As an example in a multi storied building the ground floor can be used for business purpose, the first and second floor can be used for home industry and remaining floor can be used for residential purpose

ii. Creation of open Spaces

Slum area can be differentiated from other area of a city on the ground of lacking of open space. Open space is very necessary for healthy and tension free life to slum dwellers. So for the betterment of slum life open space should be created with the help of optimum and sustainable land utilisation.

3. Land Encroachment and Land Transfer

In the slum area high proportion of householders live in the rented house, for improvement of standard of life of slum dwellers ownership of land may be given to them through encroaching public or private land.

4. Economic Enhancement

To built multi storied buildings financial support is very necessary, as the economic condition of slum dwellers is not too good to built multi storied building. That's why govt. have to make policy to built multi storage building in the slum area, Besides that the monetary fund can be arranged from the slum area by using extra land (after building multi storage building) in commercial or industrial purpose (establishment of market of small industry), which not only support financially to built multi storage building but also increase job opportunity among the slum dwellers.

5. Use of Modern Technology

For the construction of houses of environmentally sustainable modern technology and expertise must be adopted to make multi stories building. Modern technology and good expertise can make the houses healthier for living and long lasting.

6. Creation of Job Opportunity

For the overall development of slum housing condition

job opportunity must be generated, for the maintenance of houses money is very essential, lack of job no one can earn money, so for the actual improvement of slum area job opportunity also be increased.

7. Adaptation of Integrated Housing Plan

From the analysis it can easily be said that housing condition is highly inter related phenomena with accessibility to other physical infrastructure and civic amenities and facilities (water supply, sanitation, latrine, drainage etc). So for the improvement of quality of housing all these essential urban facilities must be integrated for the achievement of the goal of enhancement of the quality of life and improved.

Conclusion

For the proper and actual development of the slum areas in order to achieve the sustainable urban development, both National and State Governments have to take various developmental plans. Basically due to lack of political will no development plan has yet been implemented properly in slum area. Besides that if the rural push can be stopped by creating employment opportunities in the villages, then automatically slums will be decreased). Some plans which have already been taken for urban development, such as Jjawaharlal Nehru Urban Renewal Mission (JNNURM), Basic Infrastructure to Urban Poor (BSUP), the National Slum Development Programme, 1996 (NSDP), Valmiki Ambedkar Awas Yojana, 2001 (VAAY) etc. should be implemented properly in the slums.

References

1. A look out of slum problems (2006), Retrieved from www.nytimes.com/..../20100815-dump.html (accessed on 13.03.2012)
2. Chandramouli (2003), 'Slums In Chennai: A Profile' in Martin J. Bunch, *et al* (Ed.), *Proceeding of the Third International Conference on Environment and Health, Chennai, 15-17 December, 2003*. Chennai: Department of Geography, University of Madras and Faculty of Environmental Studies, York University, pp. 82-88.
3. Cilliers E. J. (2009), 'The Urban Development Boundary as a Planning Tool for Sustainable Urban Form: The South African Situation', *World Academy of Science, Engineering and Technology,* Vol. 30, pp 1165-1170.
4. Dandekar & Sawant (1998): Housing Needs in New Suburbs of Indian Metropolis: Case Study of Kothrud, Pune, Economic and Political Weekly, Vol. 33, No. 46 PP. 2919-2928 accessed from www.jstor.org/stable/4407382 on 28/01/2014
5. Deshpande V (2011), 'Slums in India A statistical compendium 2011' in *The Hindu*, October 15, 2011, Retrieved fromwww.thehindu.com/news/-report/article2541052.ece, (accessed on 15.07.2013)
6. GOI (2011): Report of the Working group on urban poverty, slums, and serivce delivery system, Steering Committee on Urbanization, Planning Commission, New Delhi
7. Kundu, N. (2003), 'Urban Slums Reports: The case of Kolkata', *KMDA, Kolkata*
8. Rahman M (2013), India's Slumdog census reveals poor conditions for one in six urban dwellers, The Gurdian, Delhi 22nd March, 2013,www.guardian.co.uk/world/2013/...../india-slumdog-census-poor-conditions, (accessed on 16.07.2012)
9. Sen, P (2013), Report of the Committee on Slum Statistics/Census, National Building Organisation, Ministry of Housing & Urban Poverty Alleviation, Govt. of India, 16th july 2013, http://nbo.nic.in/webforms/publications.html (accessed on 16.07.2013)
10. Siddiqui, T (2005): Incremental Housing Development Scheme, Pakistan www.worldbank.org /.... /papers/siddiqui.pdf , accessed on 04.06.2013
12. Stephenson *et al* (2004), Barriers to Family Planning Service Use among the Urban Poor in Pakistan, opportunities and choices working Paper no. 02 February, 2004
9. Sud, H (2006), Poverty and slums in India impact of changing economic landscape, *South Asia Analysis Group (SAAG*), pp. 1769-1777
10. Susan S. Fainstein, Retrieved from www.sobhameritta.com/Chennai-India (accessed on 04.06.2013)
11. Titumir *et al*(2004), 'Barriers to access to public services for the urban poor: an enquiry into dhaka slums', *Journal of the Institute of Bangladesh Studies*, Vol. XXVII, pp. 27-46
12. Nair, B (2009), Water Aid India, Retrieved fromwww.indiawaterportal.org/.../indiawaterportal.org/UrbanisationWatSan_WaterAid_India.pdf, (accessed on 6/6/ 2013)

Table 1: Land Tenure Status of Sample Slum Households, Kolkata, 2014

Income Group	Monthly / Capita Income (Rs.)	Household No. & Share	Land Tenure Status (%)			
			Patta	Occupancy Right	Private Land Encroached	Rented
Very low	<700	07 (7%)	28.57	14.28	14.28	42.87
Low	700-2000	78 (78%)	19.23	10.25	15.38	55.13
Medium	2000-3300	09 (9%)	22.22	33.33	0	44.44
High	>3300	06 (6%)	16.66	50	0	33.33
Total		100	20	15	13	52

Source: Primary survey, 2014

Table 2: Use of House in Sample Survey Area, Kolkata, 2014

Income Group	Monthly / Capita Income (Rs)	Household No. and Share	Use of House (%)		
			Residential only	Residential & Industrial	Residential & Commercial
Very low	<700	7 (7%)	100	0	0
Low	700-2000	78 (78%)	91.02	2.56	6.41
Medium	2000-3300	9(9%)	100	0	0
High	>3300	6(6%)	100	0	0
Total		100	100	2	5

Source: Primary survey 2014

Table 3: Types of house of sample slum households, Kolkata, 2014

Income Group	Monthly / Capita Income (Rs.)	Household No. and Share	Types of House (%)		
			Kuchha	Pucca	Mixed
Very low	<700	7 (7%)	28.5	0	71.4
Low	700-2000	78 (78%)	32.1	7.7	60.2
Medium	2000-3300	9(9%)	11.1	33.3	55.6
High	>3300	6(6%)	0	33.3	66.7
Total		100	28	11	61

Source: Primary survey, 2014

Table 4: Types of fuel use for cooking in sample slum households, Kolkata, 2014

Income Group	Monthly per capita Income (Rs)	Household No. and Share	Slum Households using Fuels for Cooking						
			Kerosene	Coal	Both Kerosene & coal	Wood	LPG Gas	Both Wood & Gas	Others
Very low	<700	7 (7%)	57.14	0	14.28	14.28	0	14.28	0
Low	700-2000	78 (78%)	41.02	8.97	3.84	23.07	7.69	0	15.38
Medium	2000-3300	9 (9%)	44.44	0	0	22.22	0	0	33.33
High	>3300	6(6%)	66.66	16.66	0	0	16.66	0	0
Total		(100%)	100	8	4	21	7	1	15

Source: Primary survey, 2014

Table 5: Accessibility to Bathroom Facility in Sample Slum Houses, Kolkata, 2014,

Income group	Monthly / Capita Income (Rs)	Household No. and Share	Households with Toilet & Bathroom Facility (%)	
			Have	Haven't
Very Low	<700	7 (7%)	0	100
Low	700-2000	78 (78%)	1.28	98.71
Medium	2000-3300	9(9%)	11.11	88.88
High	>3300	6(6%)	33.33	66.66
Total		100	02	98

Source: Primary survey, 2014

Table 6: Sources of Water Supply of Sample Slum Households, Kolkata, 2014

Income Group	Monthly / Capita Income (Rs)	Household No. & Share	Percentage of households with accessibility to sources of water			
			Private		Public	
			Own Hand Pump	Piped Water	Roadside Hand Pump	Piped Water
Very low	<700	7 (7%)	0	0	0	100
Low	700-2000	78 (78%)	0	0	0	100
Medium	2000-3300	9 (9%)	0	0	0	100
High	>3300	6(6%)	0	0	0	100
Total		100	0	0	0	100

Source: Primary survey 2014

Table 7: Households Facing Drainage Problem around their Premise of Sample Slum Households, Kolkata, 2014

Income Group	Monthly / Capita Income (Rs)	Household No. and Share	Households with Drainage Facility (%)		Households with Frontal Drainage (%)	
			Exist	Does Not Exist	Open	Closed
Very low	<700	7(7%)	28.57	71.42	0	100
Low	700-2000	78 (78%)	56.41	43.58	4.55	95.45
Medium	2000-3300	9 (9%)	44.44	55.55	0	100
High	>3300	6 (6%)	33.33	66.66	0	100
Total		100	52	48	3.85	96.15

Table 8: Mode of Disposal of Household Waste of Sample Slum Households, Kolkata, 2014

Income Group	Monthly / Capita Income (Rs.)	Household No. and Share	Houses with Modes of Disposal of Waste (%)			
			Official Dumping Site	Collection Point	Roadside	Burn
Very low	<700	7(7%)	28.57	14.28	42.85	14.28
Low	700-2000	78 (78%)	56.41	8.97	32.05	2.56
Medium	2000-3300	9(9%)	44.44	0	44.44	11.11
High	>3300	6 (6%)	16.66	16.66	66.66	0
Total		100	51	9	36	4

Source: Primary survey, 2014

Table 9: Frequency of Garbage Collection of Sampled Slum Households, Kolkata, 2014

Income Group	Monthly / Capita Income (Rs)	Household No. and Share	Households reporting the Problem of Frequency of Garbage Collection	
			Daily	Irregular
Very low	<700	7(7%)	0	100
Low	700-2000	78(78%)	12.76	87.23
Medium	2000-3300	9 (9%)	33.33	66.66
High	>3300	6(6%)	60	40
Total		100	11	89

Source: Primary survey, 2014

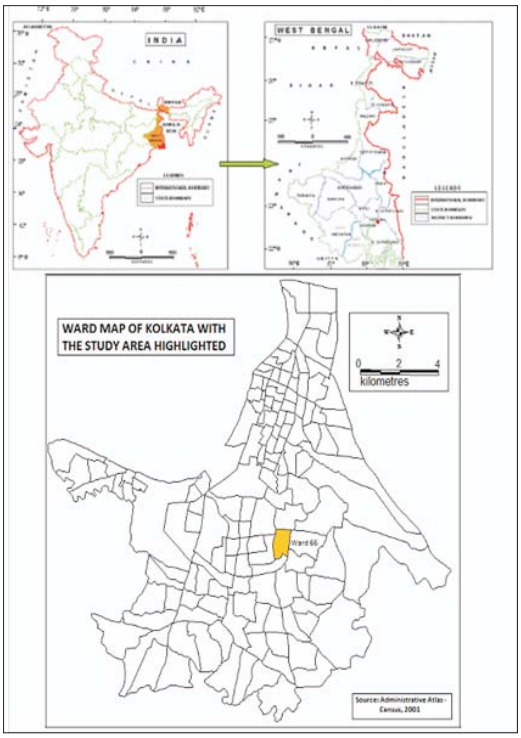

Fig. 1: Location of the Study Area


Fig. 6: Dumping of Solid Wastes and Garbage


Fig. 7: Polluted Water - source of Domestic Water


Fig.2: Housing Problem


Fig. 3: Structure and Pattern of Houses


Fig. 4: Que for Piped Supply of Drinking Water


Fig. 5: Modes of Storage of Drinking Water

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