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Women's health and hygiene in Bangalore slums: A sociological study

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Abstract

An empirical analysis of the lived experiences of more than 2,000 households in different Bangalore slums shows how migration patterns, living conditions, livelihood strategies and prospects for the future vary widely across distinct types of slums that were initially identified from satellite images and studied over a 10-year period. Shocks and responses vary in nature and intensity, and coping and accumulative strategies diverge across slum types. More fine-grained policy analyses that recognize this diversity of slum types will help people deal with shocks and increase resilience more effectively. By the end of the Millennium Development Goal's target year, 2015, India had been declared as a country, which has made moderate progress in terms of improvement in basic sanitation provision for all. Yet open defecation is still a regular practice of a significant proportion of the population in both urban and rural areas. The Indian government has been trying to address this problem for the last three decades through different programmes. However, though the effort is laudable, in reality, the countrywide situation is not so praiseworthy. Lack of sanitation provisions affects people in different ways with different intensities along the lines of class, gender, age, disability, and marginality. In Bangalore city, due to lack of proper sanitation facilities, a significant portion of the population uses public toilets, which are less in number compared to the demand. People face a variety of difficulties and hurdles in using public toilets, and as a result, continue to practice open defecation during the night and early morning. Among the users, women and adolescent girls suffer more than the others. Moreover, in this city, a significant portion of the population faces acute water crisis during the dry months. This empirical study tries to explore the different ways through which women and adolescent girls are affected by the lack of safe sanitation facilities within the house premises. The article also argues that lack of sanitation provision should be considered as a matter of violence against women and adolescent girls because the situation makes them vulnerable to the risk of being violated or sexually abused. This study showed the importance of further rehabilitation and awareness needed for the slum improvement. It encourages for a holistic approach towards improved individual and community led development programs in slum areas. Thus, not only clean water, but abundant water close to home, sanitation which does not just provide better health but also dignity and the hygiene education is important for improved lives in slums.

Keywords: Sanitation, water, health, women's security, violence, Bangalore, India

Introduction

In September 2000, world leaders came together to set the time bound goals to reduce extreme poverty in the world and named it millennium development goals. Out of these goals water supply and sanitation targets became part of the seventh goal, which aims to reduce by half the proportion of people without access to water and sanitation by 2015. But the impact of water, sanitation and hygiene was not limited only to certain sectors in the past years. Water scarcity and poor quality, lack of access to good sanitation and clean drinking water and poor hygiene contribute to malnutrition, poor health of women and children, undermine economic growth; threaten development, peace and security around the world ^[1]. Due to rapidly increasing numbers of urban slum dwellers, a specific target on slums in millennium development goal 7, target 11, was adopted which aims to significantly improve the lives of at least 100 million slum dwellers by the year 2020 ^[2]. Despite substantial progress has been made in most areas towards MDG goals still much more effort is needed to reach the set targets ^[3].

As per the report of UN Human Settlement (2003), in 2001, the urban population in the less developed parts of the world increased by 36%, which contributed to the growth in the

number of urban households by the same ratio. Thus temporary settlements like slums had increased. There were 924 million or 36% of the world urban population lived in slums in 2001. Around 44% of this population lived in developing regions in comparison to only 6% in developed regions. Asia, including all its sub regions showed 554 million, which was 60% of the world's total slum population. Seeing the enormous growth of people living in slums the growth in population of slum dwellers was predicted to be more than two billion in the next thirty years [4].

Thus, the world had seen a speedy urbanization in the past many years, especially the developing countries and India is no exception to it. Urbanization in India increased tenfold between the years 1901 to 2001. The urban centers offer various employment opportunities and ways of livelihood which attracts migration. But the infrastructural condition in terms of housing, quantity and quality of drinking water, drainage conditions of these cities are not sufficient to hold the outsized migrated population. Unrestrained prices of lands and high priced housing forces these migrants to live in temporary settlements like slums, squatters. People live in the outskirts of cities, pavements, railway tracks, hills [5]. According to census of India 2011, slums were reported from 2,543 towns which are 63%. The largest percentage of slums were reported from Maharashtra (18.1%) followed by Andhra Pradesh and West Bengal. 38% of the slum households were in 46 million plus cities [6]. At the time of the National Family Health Survey-3, India, in the year 2005-06, the highest percentage of households in the census-designated slum areas were in Mumbai (56%), followed by Meerut (43%). The National family Health Survey also notifies that the urban population.

Sanitation Concerns in India With respect to India, population density adds to the negative effects of sanitation and hence, it is a matter of serious concern. According to the 12th Plan, with the increase in urban population, the demand for all key infrastructure facilities is bound to increase, more so with respect to water and sanitation. The Planning Commission report on the Evaluation Study of Total Sanitation Campaign, 2013 shows that 72.63 per cent of rural India defecates in the open. According to the 2011 census, sanitation coverage amounts to around 30 per cent in rural areas and about 80 per cent in urban areas while budgetary allocation constitutes 0.04 per cent of the GDP. A study by WHO and UNICEF on drinking water and sanitation in 2012 indicates that 626 million people in India, i.e., nearly 51 per cent of the total population, still defecate in the open. While a segment of the population in rural areas defecate in the open, what is disturbing is that urban areas are no different. Sewerage systems, if present, suffer from very poor maintenance. Wastewater treatment facilities are highly inadequate, causing water contamination. A study by the United Nations says that the entire Indian population has greater access to mobile phones than toilets. In the slums of Mumbai, around 81 to 243 people share one toilet. This is the world's highest number, and India ranks among the first 12 countries practising open defecation, a major public health concern. Among the countries included in the World Health Organization's epidemiological sub-regions, India falls under D category, indicating high adult and child mortality.

Bengaluru Scenario Bengaluru is one of the fastest growing cities and the fifth largest city in India. Like other Indian

metropolitan cities, increased urbanisation has posed serious challenges in providing infrastructural facilities. Bengaluru's population has been growing rapidly, and the 2011 census indicates that around 84,49,944 people live in the city. The negative consequences of the urban pull have resulted in the emergence of slums characterised by housing shortage and critical inadequacies in public utilities, overcrowding, unhygienic conditions etc. Thus Bengaluru is a typical example of urban agglomeration subject to the problems of rapid urbanisation and unplanned growth. The rapid urbanisation has thrown up serious challenges in urban planning and management in terms of providing infrastructure and other civic amenities like housing, electricity, water and sanitation (Ahluwalia, 2011; Bhagat, 2011; Kundu, 2011, Kulkarni and Ramachandra, 2006).

Urban Poor and Sanitation in Bengaluru There are data discrepancies on the total number of slums. BBMP data indicates that totally there are 587 slums in Bengaluru, out of which 230 are notified and 357 are non-notified. But the data collected from the Karnataka Slum Development Board indicates that the number of slums in Bengaluru city is 597, of which 388 are notified and 209 non-notified (Annual Report 2013-14, Karnataka Slum Development Board). The data from KSDB indicates that there are 3,21,296 slum households in Bengaluru with a population of 13,86,583 (Annual Report, 2013-14, KSDB). However, the problem of sanitation, irrespective of the number of slums, remains an issue in a majority of the slums. Several independent studies have highlighted the sanitation concerns faced by the urban poor in Bengaluru city. Benjamin (2000), while dealing with the issues pertaining to women across the slums of Bengaluru, observes that women are forced to use open fields for defecation and face harassment from drunken men making it unsafe. Women prefer to save money for building their own toilets, but the lack of access to underground sewage system makes it very difficult. Lack of open space for defecation is another issue making it difficult for them to gain access to open spaces in terms of time and distance. Kala Sridhar and Venu Reddy (2011) observe that there is a potential for policy to incentivise and influence the entry of private service providers into slums. A study by Mythri Sarva Seva Samithi (2012) highlighted that 40 percent did not have access to toilets indicating that the urban poor suffer the most in terms of accessing toilets. There are instances where one toilet has to be shared by 100 people and nine toilets by 200 people (in Tasker Town, Shivajinagar). Besides, these toilets tend to become unusable due to lack of maintenance, a matter of serious concern. Several public health experts and many studies have pointed out that large sections of the urban poor are denied access to toilets. The extent of night soil disposed into open drains is a matter of serious concern in the context of health and epidemics. As per Census data, Bengaluru city has shown substantial progress in improving access to toilets, from 90.78 per cent in 2001 to 96.76 per cent in 2011. An official report in 1994 (Ravindra, 1997) says around 113,000 houses were without toilets while 17,500 had dry toilets. Sanbergen and Loes-Schenk (1996), in their study, have highlighted that of the 22 slums, nine (with a total population of 35,400) had no toilet facilities while in the remaining ten slums, there were 19 public toilets for 16,850 households or 102,000 inhabitants.

Divya Rajaraman et al. (2013) points out that little is known about barriers to sanitation at the workplace, where working

adults spend almost half of their waking hours. Her findings highlight that access to sanitation varies by occupation group, with construction workers and domestic workers being the worst affected. The consequences of inadequate access to sanitation include the shame and fear related to urination and defecation in open areas, holding back the urge to urinate or defecate, walking significant distances during working hours to use a toilet, inability to maintain an adequate menstrual.

But there are other types of slums, where conditions are “slummier” and people are poorer. Blue polygon slums (discussed below) fulfil all the conditions specified in the official definition for enumeration for the Census of India: “A compact area of at least 300 population or about 60–70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities.”^[12] Intermediate slum types are progressively better off in relation to one or more of these conditions. But since the worse slum types rarely form part of government records or city maps, they are harder to pin down, far less investigate.

Hardly anyone living in the notified slums is newly arrived in Bangalore. In fewer than 10 per cent of interviewed households was the adult male (or female) a first generation migrant; 10 per cent are second generation Bangalore residents; nine per cent are third generation residents; and more than 70 per cent have lived in Bangalore for four or more generations. So where do new migrants go when they come to Bangalore, as so many do year after year? Where do the poorest people live, if not in slums? How does one locate these places? Since existing data sources are of little help, new reliable methods of data collection are needed.

We began our exercise by dividing the area administered by the municipal authority, the Bruhat Bangalore Mahanagara Palike (BBMP),^[13] into four equal-sized quadrants on a map of Bangalore drawn on Google Earth^[14] and identifying settlements (or polygons) that could then be ground-verified quadrant by quadrant. For most settlements, satellite images start in 2000 although some only have images dating back to 2002 or 2004. The majority have an updated 2011 image but some only have images dating back to 2010. The first year with a satellite image was referred to as the “initial year” and the most recent year as the “final year”, allowing us to measure and compare average changes per year in.

Methodology

Despairing of the poor state of knowledge, particularly regarding slum locations and boundaries, investigators have turned recently to remote sensing techniques^[10]. Our work in Bangalore extends this trend by comparing Google Earth images over a 10-year time horizon to help achieve the following objectives:

- Identifying low-income settlements and detecting newly formed slums;
- Tracking changing slum boundaries;
- Distinguishing types of slums; and
- Geo-referencing sample households with the intention of reinter viewing them at regular intervals (since addresses within slums are notoriously hard to locate, with street names and street alignments changing frequently).

The decision to explore Google Earth images was taken after an initial round of surveys in 2010 within 14 slum settlements selected at random from among the list of notified slums provided by the Karnataka Slum Development Board (KSDB). These settlements were categorized according to a number of parameters, including years in existence, distance from commercial hubs, poverty ranking as determined by local experts, and social and religious composition. Field investigations were carried out by a local team, several among whom lived within similar slum communities. Every sixth household was selected for interview and only a few refused. Mostly, an adult female was interviewed.

Detailed interviews with 1,481 households in these 14 notified settlements showed that they represented the tip of a vast iceberg, home not so much to the poorest as to a settled lower-middle class, most of whom had lived in Bangalore for multiple generations. These slums are furthest from the official definition, with permanent constructions prevailing and electricity connections and clean drinking water commonly available. Poverty is low compared to the city average (14 per cent as against 26 per cent estimated for urban Karnataka by the officially appointed Tendulkar Committee). In terms of assets, income and prevalence of poverty, notified slum dwellers are near the middle of the city’s socioeconomic spectrum. Nearly every household owns a kerosene or gas stove; 80 per cent own television sets, pressure cookers and electric fans; and two-thirds own mobile phones. Education and home ownership are the highest spending priorities. Nearly all children go to school, most staying on through high school.

People here are generally left to cope on their own. They rely only on immediate family or neighbours for support. Only a tiny percentage have been able to call upon employers, community leaders, government officials, political parties, NGOs or any other organized force for help with dealing with everyday or emergency situations.

Prospects for advancement and permanence are severely compromised by visits two or three times a year to their native villages to look after the land and family left behind and to service the debts that originally brought them to Bangalore. Only 32 households (five per cent) had not visited their native villages during the 12 months preceding this survey; another 157 households had made one visit, 229 two visits and the remaining 213.

Table 1: First generation settlements: Scheduled Castes, Scheduled Tribes and non-Hindus

Neighbourhood	Household count	Scheduled Castes	Scheduled Tribes	Muslim or Christian
Quadrant I: Polygon–Hudi	80	50	30	
Quadrant I: Polygon–Whitefield A	35	35		
Quadrant IV: Polygon–HSR Layout A	150	90	60	
Quadrant II: Polygon–Peenya Phase B	60	50	10	
Quadrant II: Polygon–Chikka Venkatappa Layout	10	6	4	
Quadrant I: Polygon–Nagavarapallaya B	15	15		
Quadrant I: Polygon–Manyata Residency	160	120	30	
Quadrant II: Polygon–Atturu	60	60		
Quadrant II: Polygon–Goraguntepalya	25	25		
Quadrant III: Polygon–Bangarapanagar A	60	45		15
Quadrant III: Polygon–Bangarapanagar B	25	5	20	
Quadrant III: Polygon–Kenchenhalli	18	18		
Quadrant III: Polygon–RNS Institute of Technology	80	80		
Quadrant IV: Polygon–Kaikondrahalli	58	58		
Quadrant IV: Polygon–Manjunatha	150	75		30
Quadrant IV: Polygon–Thubarahalli	70	60		10
Quadrant IV: Polygon–Nallurhalli	130	100		15
Quadrant IV: Polygon–Pattandur Agrahara	50	50		
Total	1,236	942	154	70

Source: Original data from surveys carried out in 2013.

Had made three or more visits to their native village in the year preceding the interviews. On average, 2.3 trips, usually costly, were made annually, with a total of 32 days spent in the village. As many as 494 households 80 per cent – have one or more debts outstanding in their home village, averaging Rs.116,800, with interest ranging between two and four per cent monthly. Most of these loans are from moneylenders, with about one-quarter from family and friends.

Repeatedly, these people informed us that they came to the city mainly to repay the debts that their families had accumulated in the village. Whatever they can save goes into building a better life back in the village. Opportunities for self-improvement in the city are passed by – neither actively pursued nor even visualized as real possibilities. As indicated in Table 2, more than one-quarter of average

monthly expenditure goes toward obligations connected with the village, and the average household sends Rs. 1,840 back every month.

Only a tiny proportion of the household budget, 4.8 per cent, is spent on education. In fact, no more than 21 per cent of all 631 households spend any amount whatsoever on tuition, fees and other school-related expenditure. Very few children are sent to school. Table 3 shows the distribution of educational attainment by age and gender. Access to education seems to be improving but only very slowly. Meanwhile, the education “threshold” – the point at which educational qualifications make a significant difference to earning potential – has been rising in India.

Slum Types and Adaptation Strategies: Bangalore

Table 2: Monthly household expenditure in first generation slums

Category	Average monthly expenditure (Rupees)	Share of total expenditure (%)
House rent	385	5
Food	4,102	53
School fees and tuition	361	5
Medical	703	9
Debt repayment	1,246	16
Travel and remittances	935	12
Total	7,732	100

Source: Original data from 2013 household survey.

Table 3: Level of education in first generation slums

Education (in years)	Age (in years)								
	0–6 years			7–14 years			> 14 years		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0 (no education)	29	32	61	63	93	156	715	792	1,507
1–7	46	32	78	126	134	260	165	59	224
8–12	0	0	0	34	21	55	156	60	216
Higher education	0	0	0	0	0	0	1	1	2
Total	75	64	139	223	248	471	1,037	912	1,949

Source: Original data from 2013 household survey.

More than three-quarters (77 per cent) of all household members aged 14 years or older have never been to school. More young people of school-going age are out of school

than in while living in the city, and those who do attend do so sporadically, mostly dropping out after only a couple of years. The few who attend school regularly are those who

remained behind in the village. Education is conducted in local languages in the schools these children attend, with 75 per cent and 16 per cent, respectively, attending Kannada- and Telugu-medium schools; only four per cent of these households' children attend English-medium schools. In notified slums, by contrast, most young people go through high school, 60 per cent with an English-medium education, the better to raise career prospects. Economic difficulties and an itinerant life make it hard for blue polygon residents to keep children in school. Lack of official identity papers is a further deterrent. The papers they possess relate to their residence in their native village. Only a small proportion are registered in any way in Bangalore – nine per cent are registered to vote there, six per cent have a Bangalore ration card and only one per cent have a Bangalore-based unique ID (or Aadhar) card. The corresponding percentages holding village identifications are 69 per cent, 65 per cent and 17 per cent, respectively. School enrolment, along with other social services or benefits in the city, becomes virtually impossible where people's very existence remains unrecognized and unregistered.

Cut off from flows of social assistance as well as flows of information and influence, blue polygon residents eke out a meagre living, surviving from day to day but hardly making progress from year to year. Inter-generational occupational mobility is virtually non-existent. Principal occupations among current male heads of households are very much the same as they were for their fathers and grandfathers, the vast majority of whom also hired themselves out as casual labour, albeit as agricultural and plantation labour.

The small advances they are able to make are often compromised by adverse events. Exposed to risk in two places – in their city tents as well as in their native villages – the lives of first generation slum residents are doubly precarious. Along with droughts and rainfall failures, deaths, marriages and poor health combine to eat deeply into their meagre savings, making further debt necessary in the majority of cases. A total of 447 households (71 per cent) reported experiencing a health incident requiring substantial expenditure (Rs. 30,285, on average) in the preceding year.

Over the previous five years, marriage expenses added more than Rs. 100,000 to the outstanding debts of 391 households (62 per cent).

The city livelihood patterns of these people, coupled with meagre or non-existent policy supports, instead of enhancing resilience place a low upper limit upon their prospects. And the threat of eviction is ever present. Yet, because of the lack of alternatives, some of these residents have been in place for 10 years or more and the average age of the settlements is more than 6.5 years.

Comparing First and Fourth Generation Slums

In notified slums, by contrast, residents do not merely survive but build assets and invest in education and skills. Many become part of a lower-middle class, a result of incremental gains won over multiple generations through a series of political gains and official accommodations. As mentioned above, these settlements have been in existence for a long time and most residents trace their association with Bangalore over multiple generations.

Various points of comparison – asset holdings, occupations, aspirations and investments in children's education, identity cards, vulnerability to natural disasters – indicate how different first generation migrants in blue polygon areas are compared to fourth generation notified slum residents. In one respect, slum residence, no matter what type, has a similar consequence – most slum residents are only poorly connected to the institutions that make the city a source of economic dynamism for other population groups. Lack of information and connection are common themes. In other respects, however, understanding the differences that exist across diverse types of slums and coming to grips with the sources of these differences is critical for effective policy formulation. Photos 1, 2A and 2B provide visual evidence of the contrasts that exist between these two types of slum.

Asset holdings. A household's asset holdings provide one indication of its ability to withstand shocks without succumbing to poverty. Comparing the asset holdings of the 631 first generation (blue polygon)

Table 4: Asset ownership (percentage households owning each type of asset)

Asset type	Fourth generation residents (notified slums) (%)	First generation residents (blue polygons)	
		Bangalore (%)	Bangalore or native village (%)
Kerosene or gas stove	98	7	11
Television	84	1	22
Electric fan	84	1	24
Pressure cooker	81	1	3
Dressing table or <i>almirah</i>	43	0	6
DVD or CD player	22	0	6
Bicycle	18	6	22
Motorcycle or scooter	17	3	5
Refrigerator	6	0	0
Sewing machine	6	0	1
Washing machine	4	0	0
Mobile phone	81	75	82

Source: Original data from 2013 household survey.

households with those of 1,011 fourth generation households (more than 70 per cent of all those interviewed in notified slums in 2010) provides one measure of the gulf separating these two types of slum ^[20].

Hardly any fourth generation residents of notified slums in Bangalore have any ongoing relationship, economic or social, with a rural village. Their asset holdings, like their sources of livelihood, are entirely contained within

Bangalore. By contrast, first generation blue polygon residents divide their time and often their families between the city and the village. Table 4 reflects these divided livelihoods, considering both the city asset holdings of blue polygon residents and their combined assets in the city and the native village.

The asset holdings of fourth generation slum residents dwarf those of first generation migrants; more than 80 per cent

possess televisions, electric fans and pressure cookers compared to one per cent or fewer within the blue polygon settlements (although slightly higher if we consider combined city and village assets).

Taking home ownership into account further reinforces the impression that these are different classes of people. More than half the fourth generation residents own their homes and most (85 per cent) have titles to the land and building.

By contrast, not one blue polygon resident owns a home in the city. Asset-building among notified slum dwellers takes place incrementally, first with the acquisition of a home and the basic necessities, such as gas or kerosene stoves, pressure cookers and electric fans. TVs are also acquired early on in the process, serving.

Slum types and adaptation strategies: Bangalore

Table 5: Differences in principal occupations (males)

Occupation type	Fourth generation residents (notified slums) (%)	First generation residents (blue polygons) (%)
Agriculture	–	4
Carpenter/electrician/ plumber	24	2
Security guard	11	–
Office clerk	10	–
Construction worker/ <i>coolie</i>	9	68
Home-based business	7	4
Vegetable, flower or fruit seller	6	2
Shop assistant	9	–
Factory worker	5	2
Commercial driver	3	–
Teacher	3	–
Personal driver	1	1
Tailoring/embroidery	1	–
Shop owner	1	2
Unemployed and looking for work	3	11

Source: Original data from 2013 household survey.

Another big difference concerns the nature of domestic fuels used. While nearly all fourth generation households rely upon cooking gas or kerosene, all but one or two blue polygon households collect or buy firewood for their cooking needs.

Mobile phones. These are essential for keeping up with one's customers, employers and suppliers and, in the case of blue polygon residents, with families back in the native villages, and are acquired early on by slum residents of all kinds. They are a special kind of asset, only loosely related to economic status. The cheapest sets, with pre-paid plans, predominate, especially in blue polygon settlements.

Occupation types. What people do – and what their circumstances and backgrounds prepare them to do – influences what they can accomplish by way of building assets. A key difference between fourth and first generation residents relates to their place in the city's economy (Table 5).

Informal occupations predominate in both types of slums but earning potentials are vastly different. People's abilities to invest in their children's futures also differ considerably.

While first generation residents work predominantly as casual labour in building construction, fourth generation residents are distributed across a variety of occupations. Most are skilled and semi-skilled tradespeople, carpenters, electricians and suchlike. Others are employed as office clerks or security guards. Fewer than 10 per cent are employed in construction activities, the lowest paid and least secure sector of the occupational spectrum.

The range of female occupations (not reported in a separate table for want of space) reflects the differences with males. Most blue polygon women (62 per cent) are employed as casual construction labour compared to only 12 per cent of fourth generation women. Younger fourth generation

women have made considerable gains compared to their mothers and grandmothers, going on after high school to work as shop assistants, call centre operators and secretaries in offices. Education has served as a pathway to social mobility, albeit of a limited kind. No notified slum dweller in our sample had become a medical doctor, lawyer, senior government official or MBA – and no young person is currently attending the kind of educational programme that can prepare them for such careers.

Education and aspirations. Notified slum residents invest heavily in education and in the acquisition of additional skills by their children, particularly English and computer knowledge. All but a very few children attend school regularly, girls as well as boys. Boys usually get between 10 and 15 years of formal education, with a median of 12 years, and girls, on average, two years less. By contrast, most blue polygon school-age children are not in school, and only a small minority go on to high school, and then, too, in schools where instruction is in Kannada or Telugu.

Awareness of better career possibilities is far greater among residents of notified slums than among those in blue polygon slums, most of whom were unable to state any particular career aspirations for their daughters and sons. Those who did mostly cited something vague and all-encompassing such as “acquiring education” or “getting a job”. In consequence, social mobility is virtually non-existent among residents of blue polygon slums. Sons and daughters have followed mothers and fathers into low-skilled, low-paid and precarious occupations, working in the village as agricultural labour and in the city as construction labour with no secure or reliable perch.

Sources of institutional support. Mitlin and Satterthwaite assert that “... *those living in informal settlements have no influence on local government or service providers, who*

ignore them and their needs."^[21] Their depiction adequately characterizes blue polygon settlements and it applies in some part also to notified slums. Not one blue polygon resident has benefited from a job-training or skill development programme run by any government agency or NGO. Even in notified slums, fewer than 10 per cent of all currently employed fourth generation residents were able to avail themselves of any vocational training or skills-building programmes. More than 90 per cent had learned the trades they practiced through informal apprenticeships with parents, relatives or friends. Information is obtained through word of mouth; no employment exchanges or career counsellors are at hand.

Migrants, when they first come to the city, are rarely served by any government agency or, for that matter, any NGO. Those who obtained assistance did so mostly from friends and relatives. Fewer than one per cent expected to receive help from any government agency or NGO in their retirement or old age.

Our evidence does not suggest that slum dwellers prefer to remain aloof from public institutions. Given a choice, most of them want to engage actively with public institutions and obtain assistance and advice of different kinds. They want better schools, educational and housing loans on reasonable terms, vocational training, career guidance and infrastructure improvements. But few have actually received assistance in any such ways.

Within notified slums, most residents have voter ID and ration cards – another point of difference with blue polygon residents – and some have safe drinking water supplies, but access to other financial, social and educational facilities remains weak overall. We asked a number of questions about the nature of connections they have made or would wish to make with government and non-government agencies. In each case their responses pointed to impoverished networks and weak institutional connections.

People rely for the most part on their individual social networks, which are poorly endowed with resources and connections and have little capacity to facilitate connections with people who have any real influence, such as doctors, lawyers, elected officials, newspaper reporters, policemen and factory owners. When asked whether they felt able to connect with any of these (and other) people with influence, as many as 70 per cent in notified slums and 95 per cent in blue polygon settlements claimed that they would be unable to connect with even one such individual. Their social networks – the relatives, friends and neighbours whom they can consult on a regular basis – provide them with all the job-related knowledge and professional connections they are generally able to muster. Studies in other slum settlements, in India and elsewhere, show this situation is not peculiar to Bangalore.

Conclusions

Urban slum populations have been expanding rapidly in India. Two separate processes, with different internal dynamics and diverse repercussions for policy, have contributed to this growth. One is natural increase – births occurring within slums, outpacing deaths, have resulted in a natural process of population growth. This is most prevalent within longer-established slums and was particularly apparent in our surveys of notified slums. A separate process is playing out, more often at the lower end of the spectrum of slums, bringing first generation migrants into

the newest and flimsiest settlements, where poverty, uncertainty, risk and vulnerability are more central in people's lives and livelihoods and where resilience is much lower than in notified slums. Diminishing economic prospects in agriculture coupled with the lure of growing cities have contributed to this process;^[23] so too have factors associated with changing climatic conditions. The largest proportion (81 per cent) of our blue polygon interviewees stated that their principal reason for coming to Bangalore was related to increasing droughts, difficult working conditions and accumulating debts. As climate impacts add further to the precariousness of rural livelihoods, more such settlements can be expected to develop.

Currently organized in a haphazard way, wherever temporary niches are available, the kinds of settlements that currently serve as home in Bangalore to new migrants from distressed villages hardly serve as locations for building a better life. These people live within a restricted sphere with fellow settlers and migrants whose lives are equally devoid of prospects for substantial improvement. They have no official papers in Bangalore and no security of tenure – these settlements are not on local political entrepreneurs' radars and residents are liable to be evicted, as many of our interviewees have been, with little notice. Given these circumstances, families aim not so much to build a better life in Bangalore as to use the city as a means to pay off the debts contracted in their native villages. Children's education is given short shrift in the face of more compelling, immediate commitments. Home improvements are not possible once money has been sent back to the village, nor are they even desirable when the threat of eviction is ever present. These situations contrast starkly with those experienced by native-born Bangaloreans living in notified slums. Home ownership and children's education are their two highest priorities. There is no real threat of eviction for these residents and no need to send remittances elsewhere.

These differences in current lifestyles and future expectations call for different policy support. Notified slum residents will benefit most from support that can help raise social mobility, enabling their children to become not only security guards and shop assistants, as so many have, but also medical doctors, software engineers, business professionals and the like, positions so far achieved by only a few. Notified slum households invest heavily in education but the returns on these investments are currently low.

Blue polygon settlers require very different support. Their basic needs – electricity, clean drinking water, security of person and property, education, secure housing, affordable health care – remain largely unmet or require large expenditures. Lacking identity papers in the city (and not registered as constituents or voters), they have been unable to attract much political patronage or official support. Drives to acknowledge and register their presence in the city will, therefore, have to take precedence, as will policies that establish minimum standards for the most basic services^[24]. New forms of school instruction designed specifically for the itinerant nature of migrant families' lives also need to be explored.

Helping first generation migrants manage the low-level obstacles they face both in the city and in their native villages will open the door to the possibilities of building a better life. Whether this can be done by helping make rural

livelihoods more bountiful and reliable, or whether it makes better sense to pin the hopes on cities and deploy public resources in building urban infrastructure is a critical question ^[25], one to which we doubt there can be an unambiguous response.

The effort to develop complete slums maps – with clearly marked boundaries and with settlements classified in terms of a clearer typology

– must also be taken forward vigorously. Relatively little is known about how slums develop and how, when and if they make the transition from blue polygon to notified status. Our ongoing enquiries show that there is a spectrum of settlements, from blue polygons to long-notified ones. In some cases, huts have been improved incrementally into durable dwellings ^[26], but not all homes and settlements have been able to cross crucial transition points. The barriers, which some but not all settlements are able to go beyond, will become better known as research addressing these questions becomes more advanced.

In Bangalore, we are finding that the official typology, which differentiates only between notified and non-notified slums, does not adequately capture the range of existing differences. In some notified slums, individual land rights have been granted; in others, these grants have stalled. In some unrecognized slums, people have voter ID cards, ration cards and electricity connections, while in others (like the blue polygons considered here), they have none of these amenities. Making these finer distinctions is essential for formulating more effective and better-targeted policies. Our ongoing research will develop a finer typology of slums, also uncovering transition points and trajectories.

The methods presented here represent a useful starting point for similar enquiries in other cities. They have proved productive in Bangalore.

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